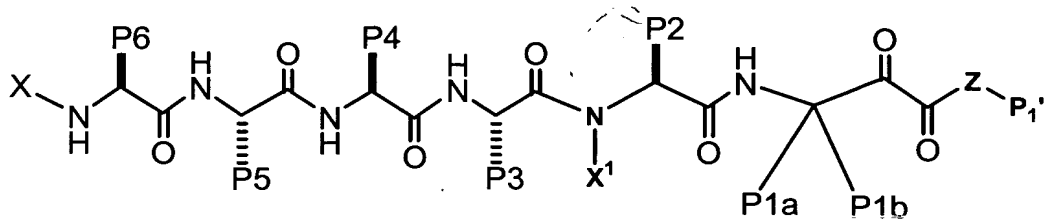
CLAIMS

What is claimed is:

1. A compound, including enantiomers, stereoisomers, rotomers and tautomers of said compound, and pharmaceutically acceptable salts, solvates or derivatives thereof, with said compound having the general structure shown in Formula I:



Formula I

wherein:

Z is O, NH or NR^{12};

X is alkylsulfonyl, heterocyclylsulfonyl, heterocyclylalkylsulfonyl, arylsulfonyl, heteroarylsulfonyl, alkylcarbonyl, heterocyclylcarbonyl, heterocyclylalkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, heterocyclyloxycarbonyl, aryloxycarbonyl, heteroaryloxycarbonyl, alkyaminocarbonyl, heterocyclylaminocarbonyl, arylaminocarbonyl, or heteroarylaminocarbonyl moiety, with the proviso that X may be additionally optionally substituted with R^{12} or R^{13};

X^1 is H; C_1-C_4 straight chain alkyl; C_1-C_4 branched alkyl or ; CH_2-aryl (substituted or unsubstituted);

R^{12} is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkyl-alkyl, heterocyclyl, heterocyclylalkyl, aryl, alkylaryl, arylalkyl, heteroaryl, alkylheteroaryl, or heteroarylalkyl moiety, with the proviso that R^{12} may be additionally optionally substituted with R^{13}.

R^{13} is hydroxy, alkoxy, aryloxy, thio, alkylthio, arylthio, amino, alkylamino, arylamino, alkylsulfonyl, arylsulfonyl, alkylsulfonamido, arylsulfonamido, carboxy, carbalkoxy, carboxamido, alkoxycarbonylamino, alkoxycarbonyloxy, alkylureido, arylureido, halogen, cyano, or nitro moiety, with the proviso that

the alkyl, alkoxy, and aryl may be additionally optionally substituted with moieties independently selected from R^{13}.

P1a, P1b, P2, P3, P4, P5, and P6 are independently:

H; C1-C10 straight or branched chain alkyl; C2-C10 straight or branched chain alkenyl;

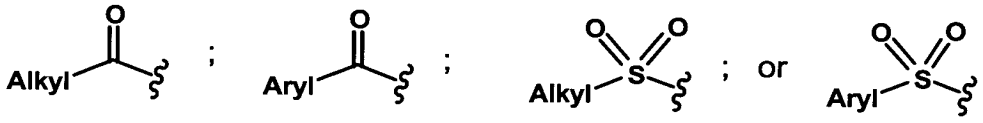
C3-C8 cycloalkyl, C3-C8 heterocyclic; (cycloalkyl)alkyl or (heterocyclyl)alkyl , wherein said cycloalkyl is made up of 3 to 8 carbon atoms, and zero to 6 oxygen, nitrogen, sulfur, or phosphorus atoms, and said alkyl is of 1 to 6 carbon atoms;

aryl, heteroaryl, arylalkyl, or heteroarylalkyl, wherein said alkyl is of 1 to 6 carbon atoms;

wherein said alkyl, alkenyl, cycloalkyl, heterocyclyl; (cycloalkyl)alkyl and (heterocyclyl)alkyl moieties may be optionally substituted with R^{13}, and further wherein said P1a and P1b may optionally be joined to each other to form a spirocyclic or spiroheterocyclic ring, with said spirocyclic or spiroheterocyclic ring containing zero to six oxygen, nitrogen, sulfur, or phosphorus atoms, and may be additionally optionally substituted with R^{13}; and

P1' is H, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkyl-alkyl, heterocyclyl, heterocyclyl-alkyl, aryl, aryl-alkyl, heteroaryl, or heteroaryl-alkyl; with the proviso that said P1' may be additionally optionally substituted with R^{13}.

2. The compound of claim 1, wherein X is selected from the group consisting of:



wherein Alkyl is a C1 to C4 straight or branched chain, and Aryl is a phenyl or substituted phenyl.

3. The compound of claim 2, wherein X is $-CO-CH_3$.

4. The compound of claim 2, wherein X is –CO-phenyl.

5. The compound of claim 1, wherein P5 and P6 are the same and are:

$-(CH_2)_n-C(O)-R^1$, where n= 1-4 and R^1 is OH, O-*t*-Bu, OR^3, NHR^3, NH-phenyl or NH-trityl, with R^3 being selected from H, C_1-C_4 straight or branched chain alkyl.

6. The compound of claim 1, wherein P5 and P6 are different and are: $-(CH_2)_n-C(O)-R^1$, where n= 1-4 and R^1 is OH, O-*t*-Bu, OR^3, NHR^3, NH-phenyl or NH-trityl, with R^3 being selected from H, C_1-C_4 straight or branched chain alkyl.

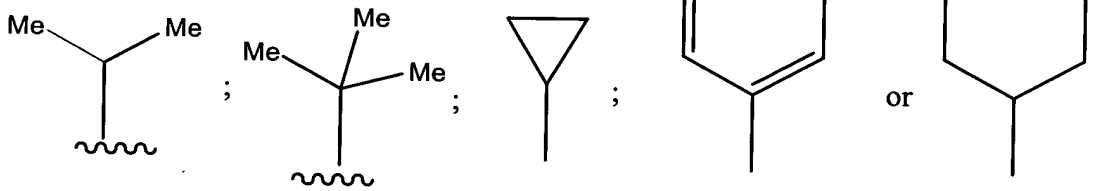
7. The compound of claim 5, wherein P5 and P6 are $-CH_2-CH_2-C(O)-O-C(CH_3)_3$ or $-CH_2-CH_2-C(O)-OH$.

8. The compound of claim 6, wherein P5 and P6 are independently selected from $-CH_2-CH_2-C(O)-O-C(CH_3)_3$ or $-CH_2-CH_2-C(O)-OH$.

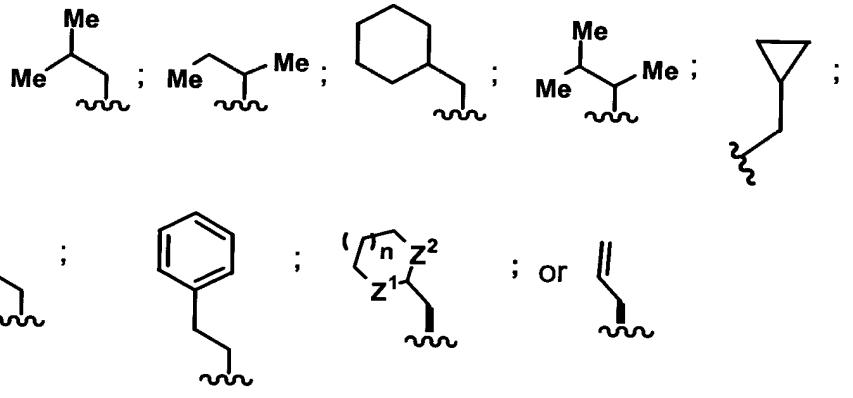
9. The compound of claim 1, wherein P3 and P4 are the same.

10. The compound of claim 1, wherein P3 and P4 are different.

11. The compound of claim 1, wherein P3 and P4 are independently selected from the group consisting of:

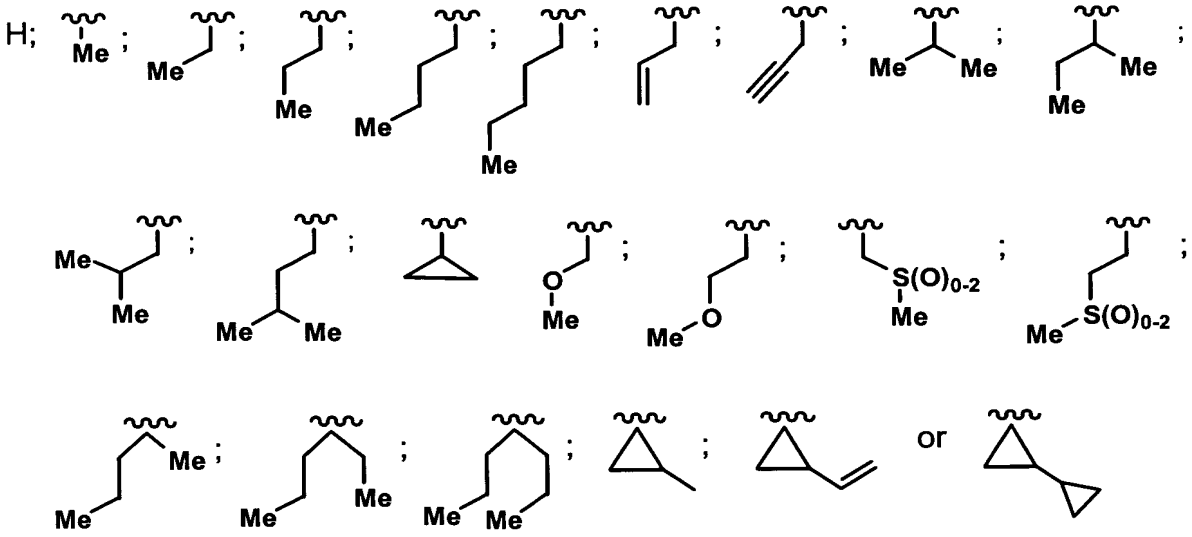


12. The compound of claim 1, wherein P2 is selected from the group consisting of:

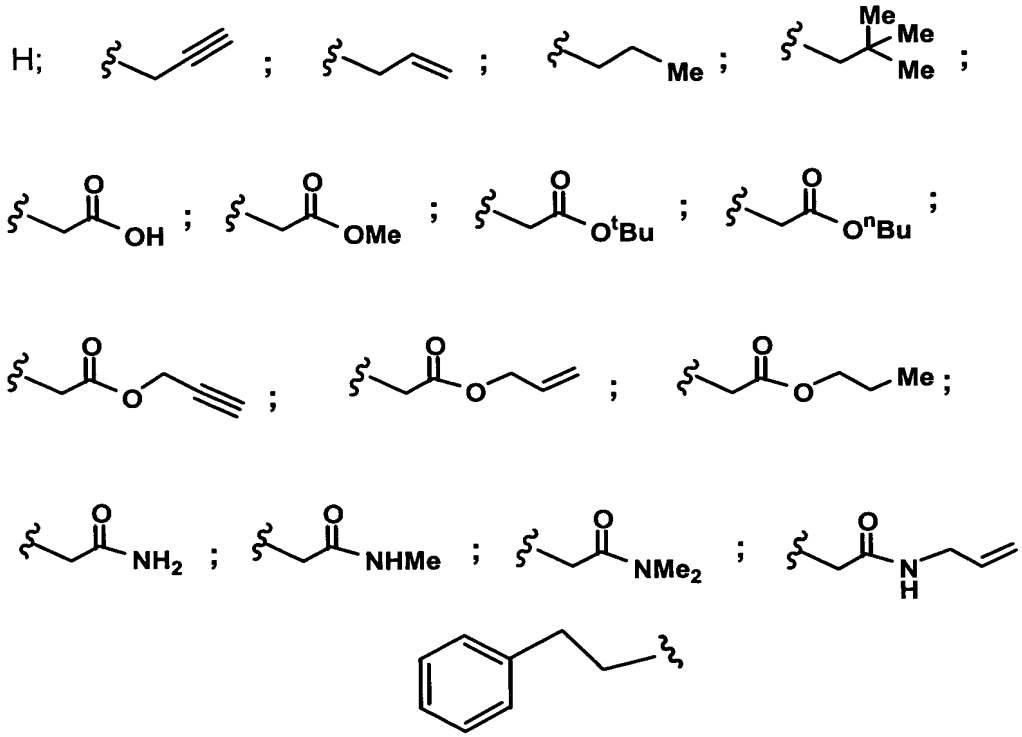


wherein n is 0, 1, 2 or 3.

13. The compound of claim 1, wherein P1a and P1b are independently selected from the group consisting of:

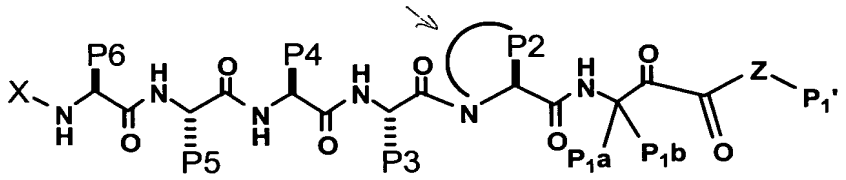


14. The compound of claim 1, wherein P1' is selected from the group consisting of:



15. The compound of claim 1, wherein Z is NH and X^1 is H.

16. A compound, including enantiomers, stereoisomers, rotomers and tautomers of said compound, and pharmaceutically acceptable salts or solvates of said compound having the general structure shown in Formula II:



Formula II

wherein:

Z is O, NH or NR^{12};

X is alkylsulfonyl, heterocyclylsulfonyl, heterocyclylalkylsulfonyl, arylsulfonyl, heteroarylsulfonyl, alkylcarbonyl, heterocyclylcarbonyl, heterocyclylalkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, heterocyclyloxycarbonyl, aryloxycarbonyl, heteroaryloxycarbonyl, alkyaminocarbonyl, heterocyclylaminocarbonyl, arylaminocarbonyl, or heteroarylaminocarbonyl moiety, with the proviso that X may be additionally optionally substituted with R^{12} or R^{13};

R^{12} is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkyl-alkyl, heterocyclyl, heterocyclylalkyl, aryl, alkylaryl, arylalkyl, heteroaryl, alkylheteroaryl, or heteroarylalkyl moiety, with the proviso that R^{12} may be additionally optionally substituted with R^{13};

R^{13} is hydroxy, alkoxy, aryloxy, thio, alkylthio, arylthio, amino, alkylamino, arylamino, alkylsulfonyl, arylsulfonyl, alkylsulfonamido, arylsulfonamido, carboxy, carbalkoxy, carboxamido, alkoxycarbonylamino, alkoxycarbonyloxy, alkylureido, arylureido, halogen, cyano, or nitro moiety, with the proviso that the alkyl, alkoxy, and aryl may be additionally optionally substituted with moieties independently selected from R^{13};

P1a, P1b, P2, P3, P4, P5, and P6 are independently:

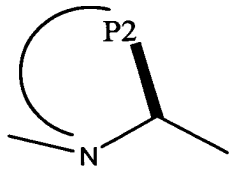
H; C1-C10 straight or branched chain alkyl; C2-C10 straight or branched chain alkenyl;

C3-C8 cycloalkyl, C3-C8 heterocyclic; (cycloalkyl)alkyl or (heterocyclyl)alkyl , wherein said cycloalkyl is made up of 3 to 8 carbon atoms, and zero to six oxygen, nitrogen, sulfur, or phosphorus atoms, and said alkyl is of 1 to 6 carbon atoms; or

aryl, heteroaryl, arylalkyl, or heteroarylalkyl, wherein said alkyl is of 1 to 6 carbon atoms;

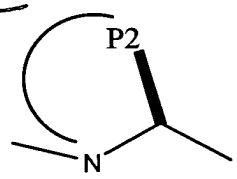
wherein said alkyl, alkenyl, cycloalkyl, heterocyclyl, (cycloalkyl)alkyl and (heterocyclyl)alkyl moieties may be optionally substituted with R^{13} and further wherein said P1 may optionally be a spirocyclic or spiroheterocyclic ring, with said spirocyclic or spiroheterocyclic ring containing zero to six oxygen, nitrogen, sulfur, or phosphorus atoms, and may be additionally optionally substituted with R^{13}; and

P1' is H, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkyl-alkyl, heterocyclyl, heterocyclyl-alkyl, aryl, aryl-alkyl, heteroaryl, or heteroaryl-alkyl; with the proviso that said P1' may be additionally optionally substituted with R^{13}; and



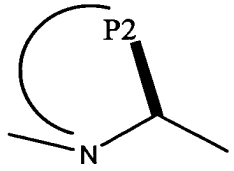
indicates a cyclic ring structure, with the proviso that said cyclic ring structure does not contain a carbonyl group as part of the cyclic ring.

17. The compound of Claim 16, wherein said



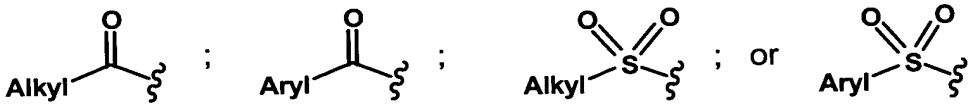
indicates a five-membered ring.

18. The compound of Claim 16, wherein said



indicates a six-membered ring.

19. The compound of claim 16, wherein X is selected from the group consisting of:



wherein Alkyl is a C1 to C4 straight or branched chain, and Aryl is a phenyl or substituted phenyl.

20. The compound of claim 19, wherein X is $-CO-CH_3$.

21. The compound of claim 19, wherein X is –CO-phenyl.

22. The compound of claim 16, wherein P5 and P6 are the same and are: $-(CH_2)_n-C(O)-R^1$, where n= 1-4 and R^1 is OH, O-*t*-Bu, OR^3, NHR^3, NH-phenyl or NH-trityl, with R^3 being selected from H, C_1-C_4 straight or branched chain alkyl.

23. The compound of claim 16, wherein P5 and P6 are different and are: $-(CH_2)_n-C(O)-R^1$, where n= 1-4 and R^1 is OH, O-*t*-Bu, OR^3, NHR^3, NH-phenyl or NH-trityl, with R^3 being selected from H, C_1-C_4 straight or branched chain alkyl.

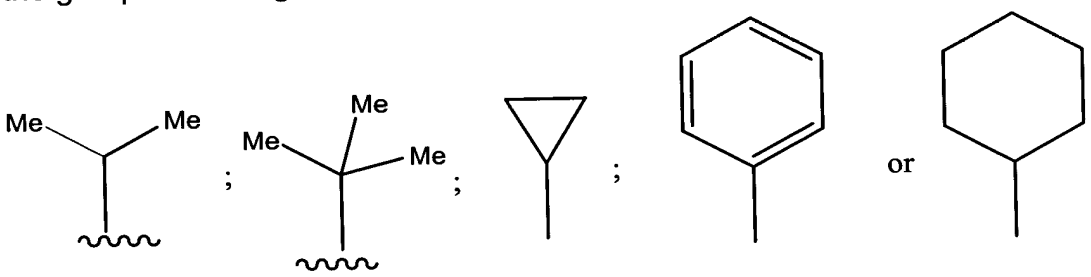
24. The compound of claim 22, wherein P5 and P6 are $-CH_2-CH_2-C(O)-O-C(CH_3)_3$ or $-CH_2-CH_2-C(O)-OH$.

25. The compound of claim 23, wherein P5 and P6 are independently selected from $-CH_2-CH_2-C(O)-O-C(CH_3)_3$ or $-CH_2-CH_2-C(O)-OH$.

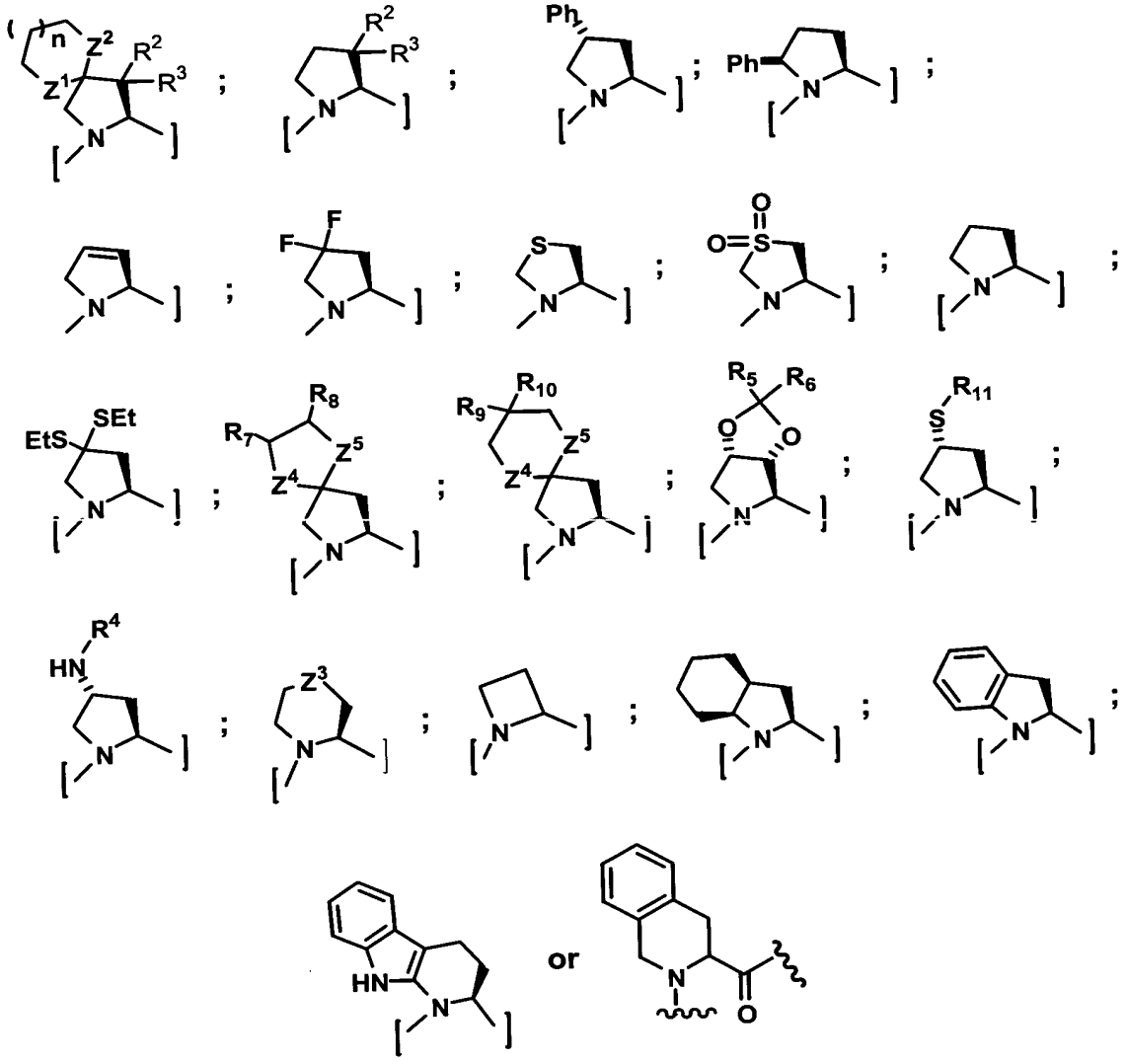
26. The compound of claim 16, wherein P3 and P4 are the same.

27. The compound of claim 16, wherein P3 and P4 are different.

28. The compound of claim 16, wherein P3 and P4 are independently selected from the group consisting of:



29. The compound of claim 16, wherein P2 is selected from the group consisting of:



wherein n = 0, 1, 2, or 3; and

$R^2 = R^3 = H$; R^2 = C_1 to C_6 straight chainalkyl or cycloalkyl; $R^3 = H$

R^4 = COAlkyl (straight chain or cyclic, C_1 to C_6); COAryl; COOAlkyl; COOAryl

$R^5 = H$; R^6 = Alkyl (C_1 to C_3); $R^6 = H$; R^5 = Alkyl (C_1 to C_3)

$R^7 = H$; R^8 = Alkyl (C_1 to C_3), CH_2OH; $R^8 = H$; R^7 = Alkyl (C_1 to C_3), CH_2OH;

$R^7 = R^8$ = Alkyl (C_1 to C_3), CH_2OH

$R^9 = R^{10}$ = Alkyl (C_1 to C_3); R^9 = H, R^{10} = Alkyl (C_1 to C_3), COOMe, COOH,CH_2OH;

R^{10} = H, R^9 = Alkyl (C_1 to C_3), COOMe, COOH,CH_2OH;

R^{11} = Alkyl (C_1 to C_6 straight chain, branched or cyclic), CH_2Aryl (may be substituted)

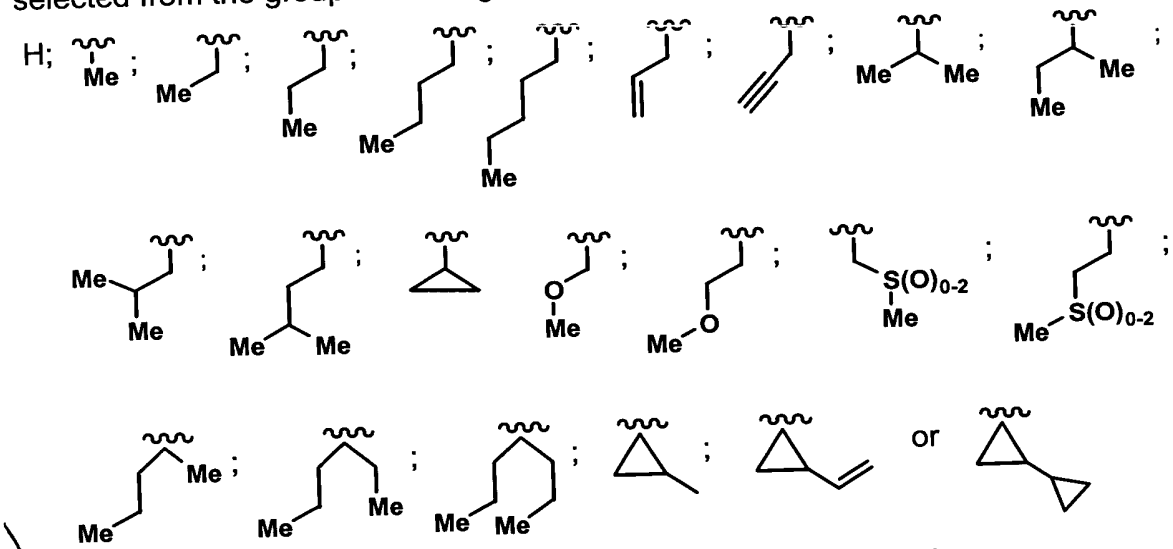
$Z^1 = Z^2$ = S, O; Z^1 = S, Z^2 = O; Z^1 = O, Z^2 = S; $Z^1 = CH_2$, Z^2 = O; Z^1 = O, $Z^2 = CH_2$;

Z_1 = S, $Z_2 = CH_2$; $Z^1 = CH_2$, Z^2 = S

$Z^3 = CH_2$, S, SO_2, NH, NR^4

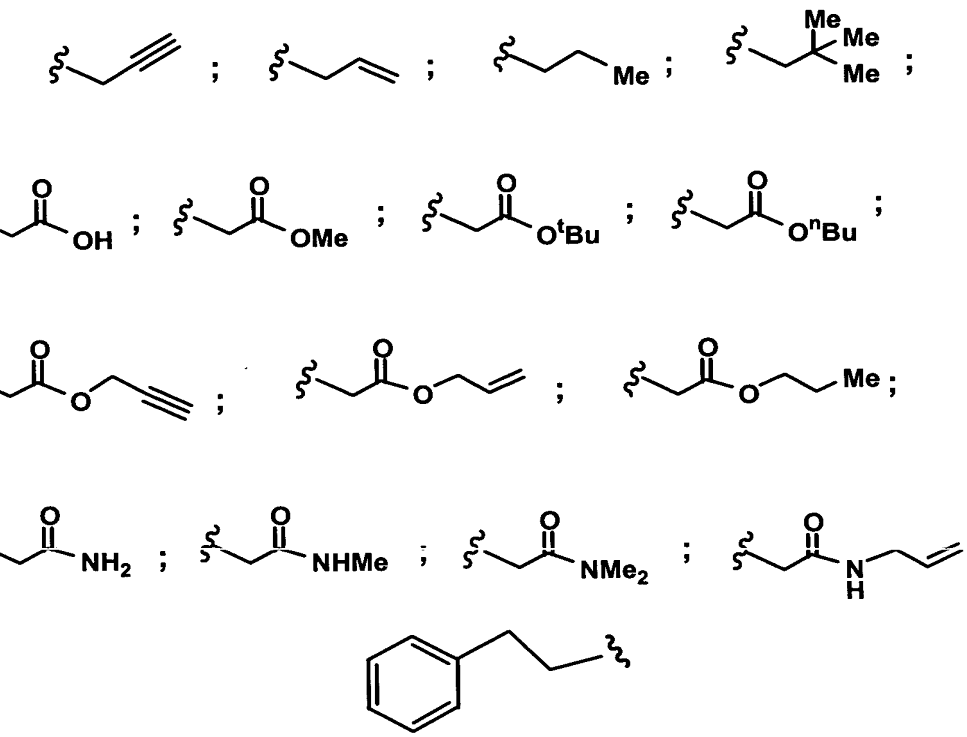
$Z^4 = Z^5$ = S, O

29. The compound of claim 16, wherein P1a and P1b are independently selected from the group consisting of:



30. The compound of claim 16, wherein P1' is selected from the group consisting of:

H;



32 ~~31.~~ The compound of claim 16, wherein Z is NH.

33 ~~32.~~ A pharmaceutical composition comprising as an active ingredient a compound of claim 1 or claim 16.

34 ~~33.~~ The pharmaceutical composition of claim 32 for use in treating disorders associated with Hepatitis C virus.

35 ~~34.~~ The pharmaceutical composition of claim 32 additionally comprising a pharmaceutically acceptable carrier.

36 ~~35.~~ A method of treating disorders associated with the HCV protease, said method comprising administering to a patient in need of such treatment a pharmaceutical composition which composition comprises therapeutically effective amounts of a compound of claim 1 or claim 16.

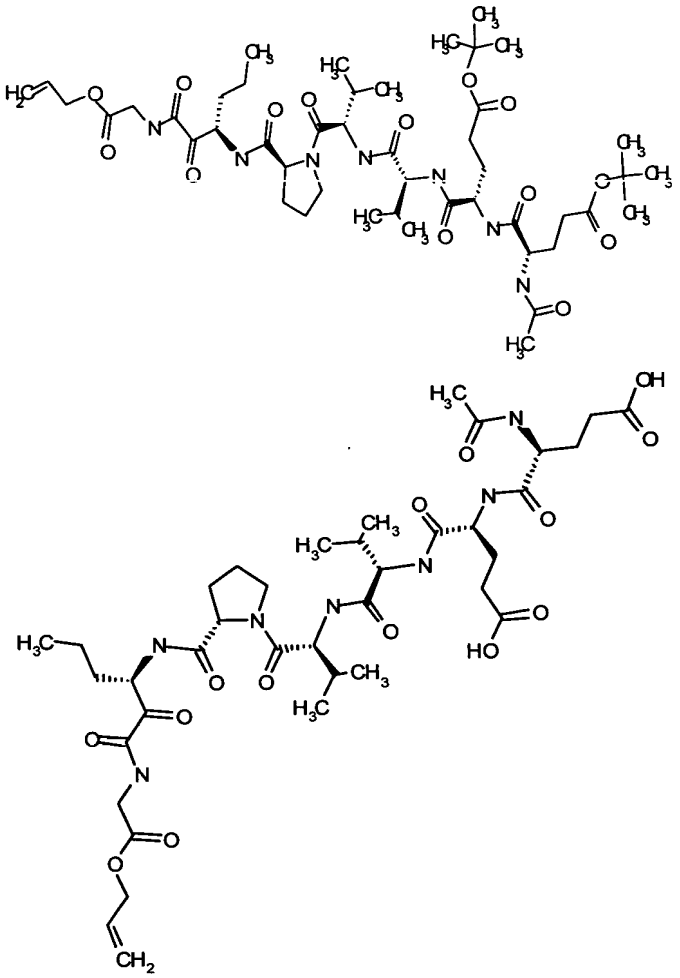
37 ~~36.~~ The method of claim 35, wherein said administration is via subcutaneous administration.

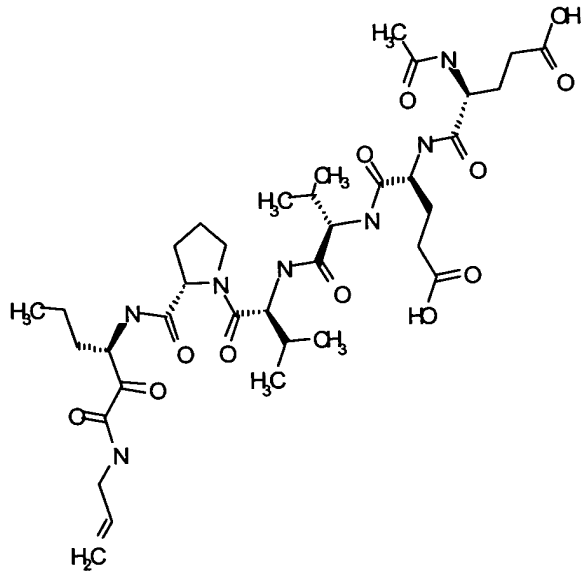
38 ~~37.~~ The use of a compound of claim 1 or claim 16 for the manufacture of a medicament to treat disorders associated with the HCV protease.

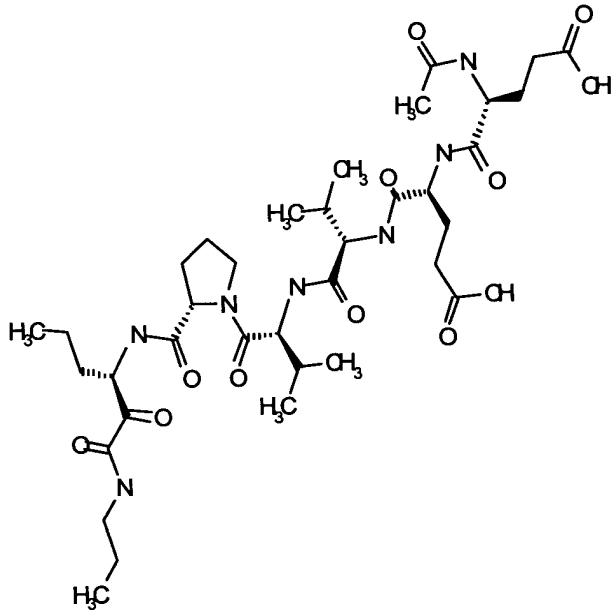
39 ~~38.~~ A method of preparing a pharmaceutical composition for treating disorders associated with the HCV protease, said method comprising bringing into intimate

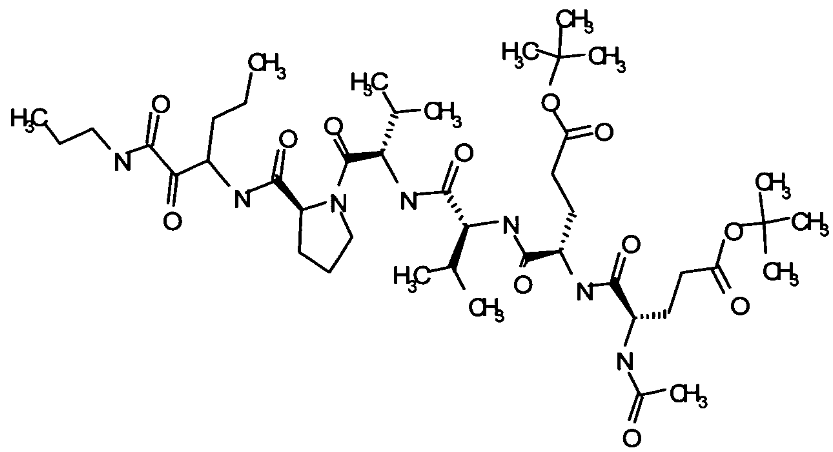
contact a compound of claim 1 or claim 16 and a pharmaceutically acceptable carrier.

39. A compound exhibiting HCV protease inhibitory activity, including enantiomers, stereoisomers, rotamers and tautomers of said compound, and pharmaceutically acceptable salts or solvates of said compound, said compound being selected from the group of compounds with structures listed below:





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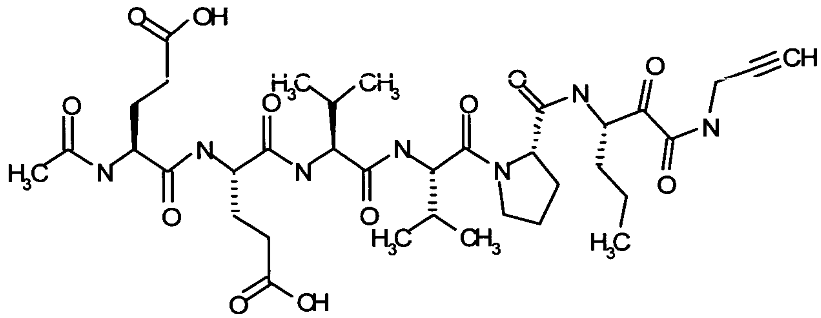
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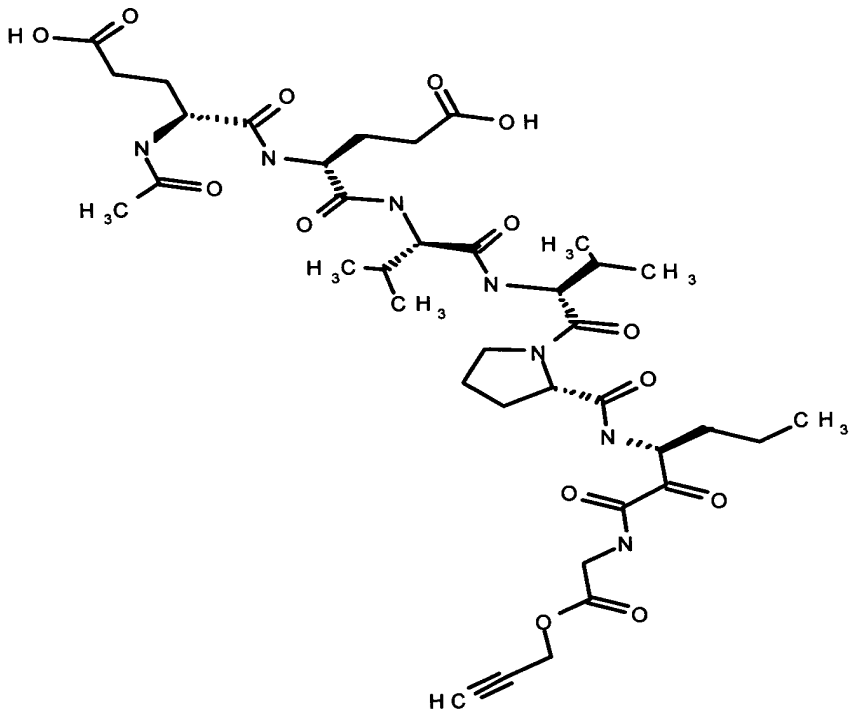
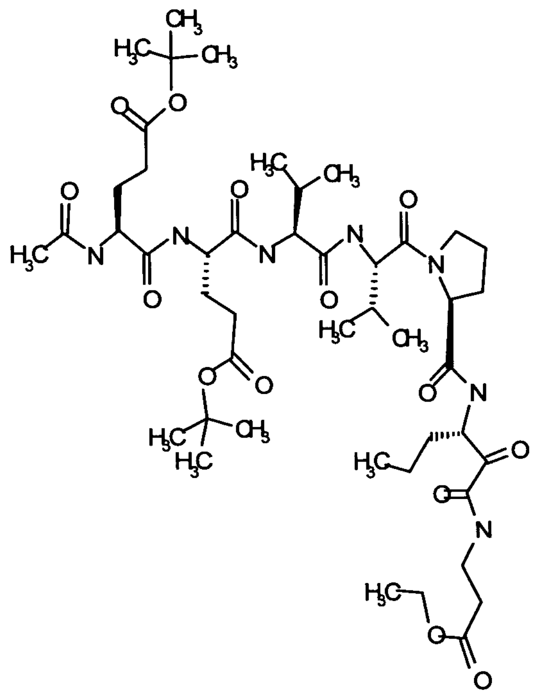
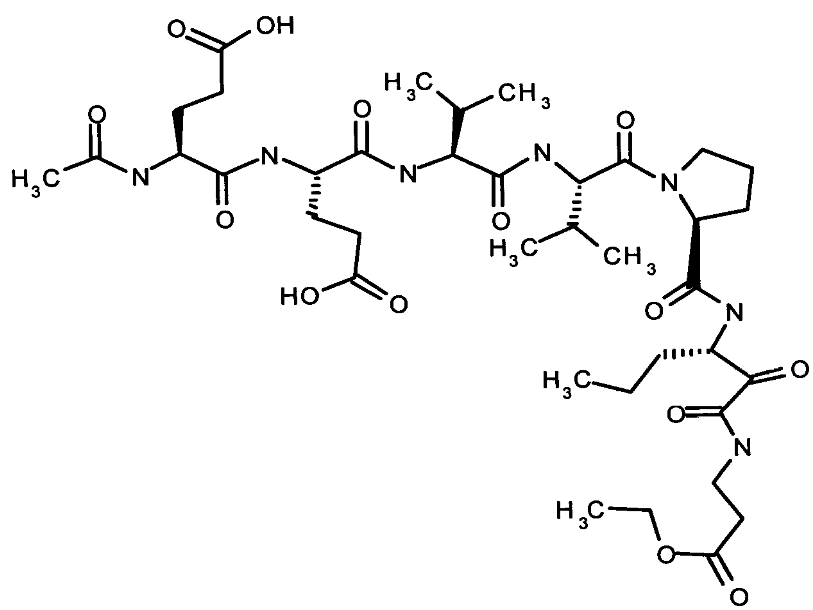
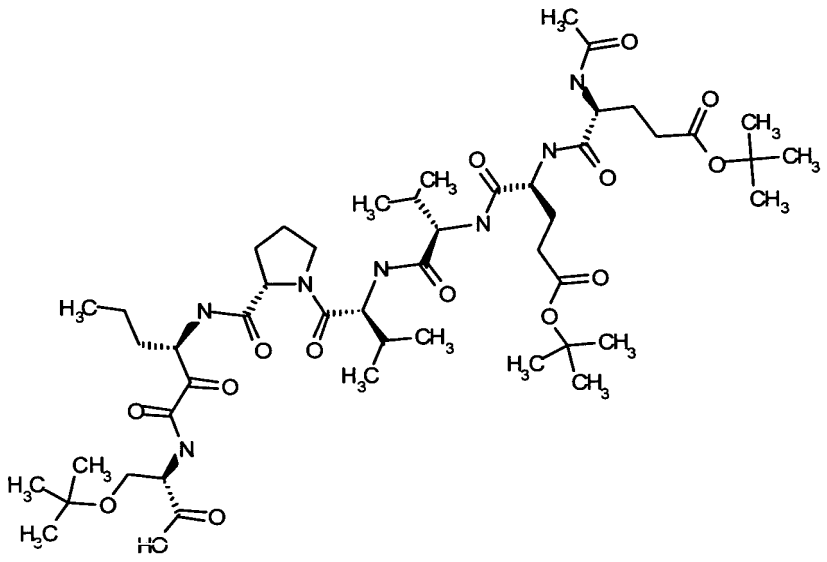
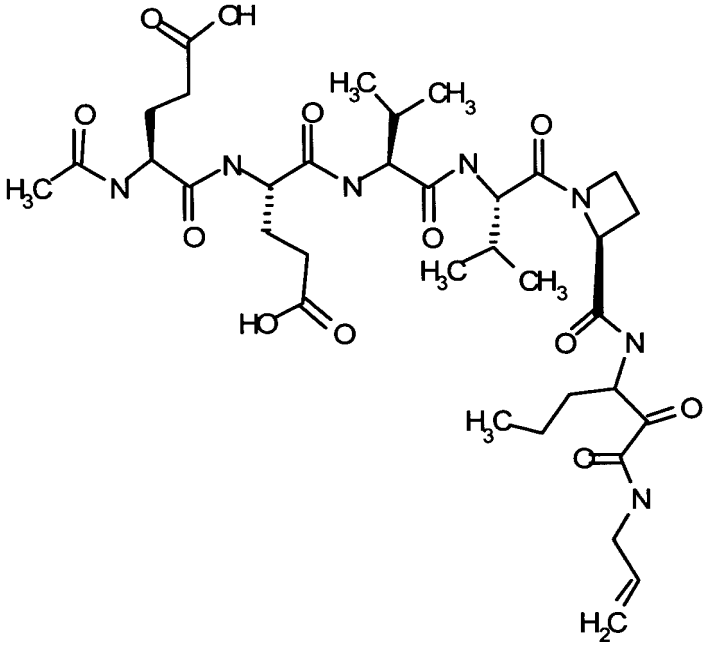
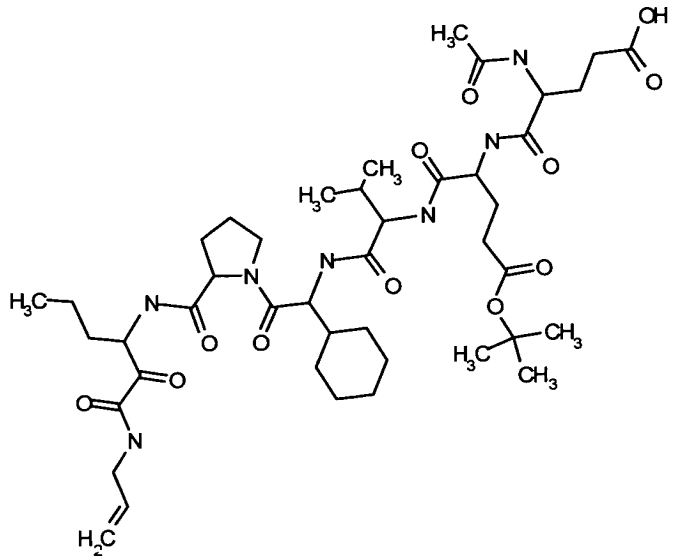


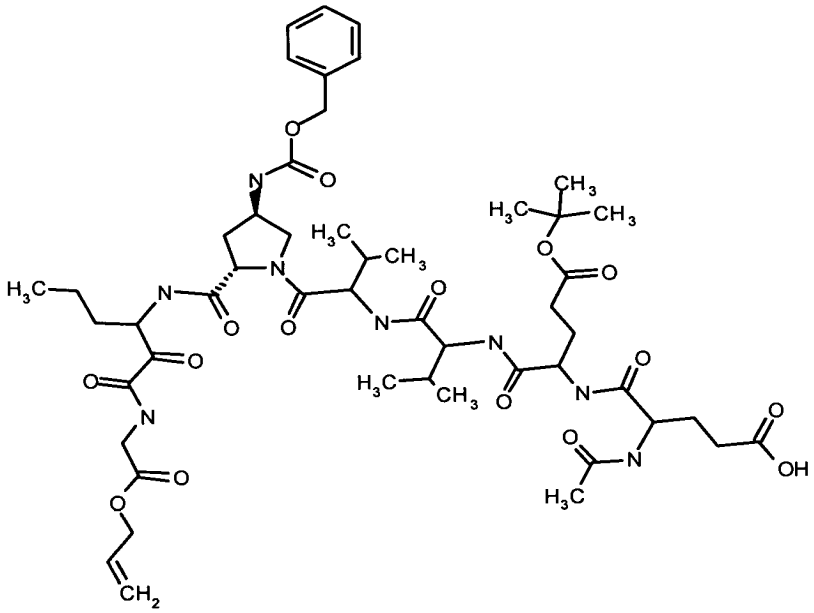


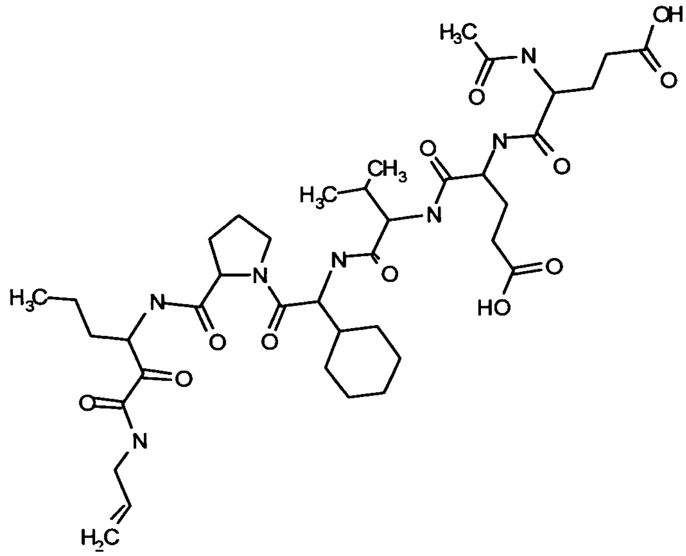


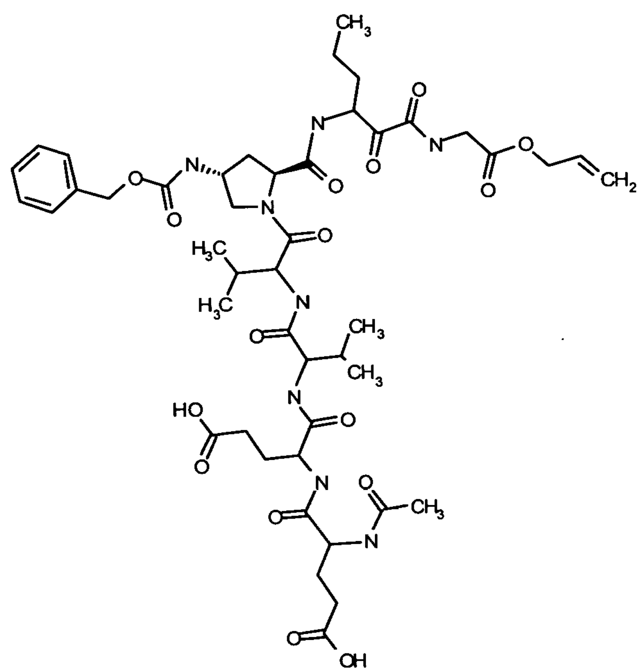


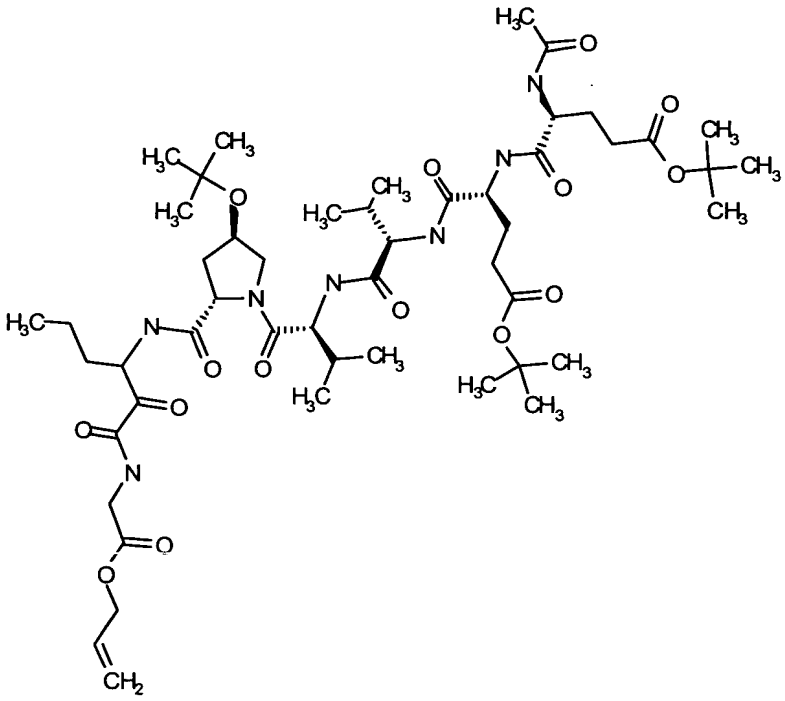


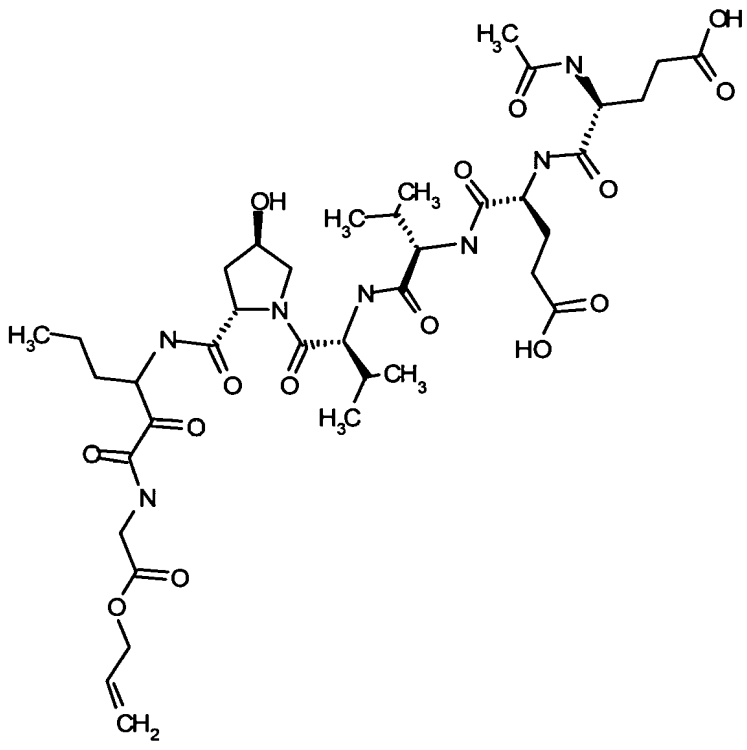


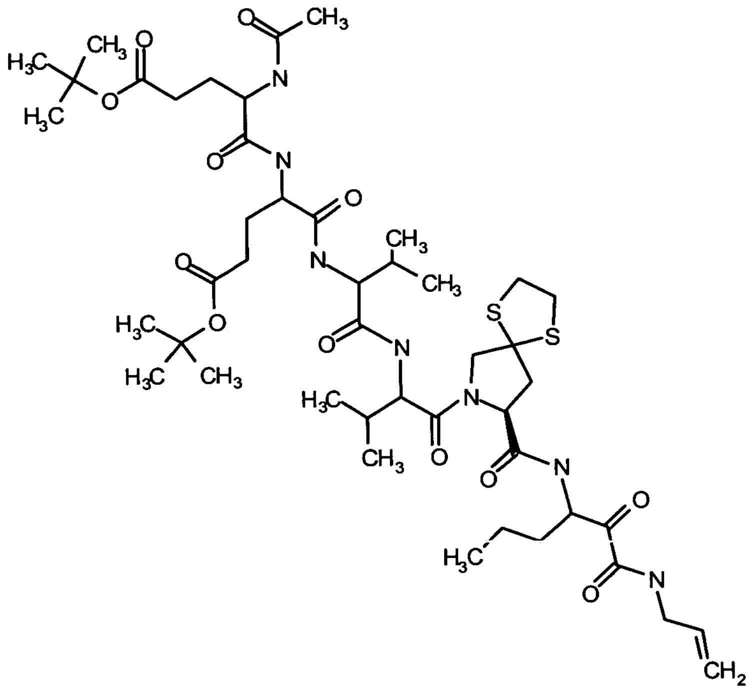


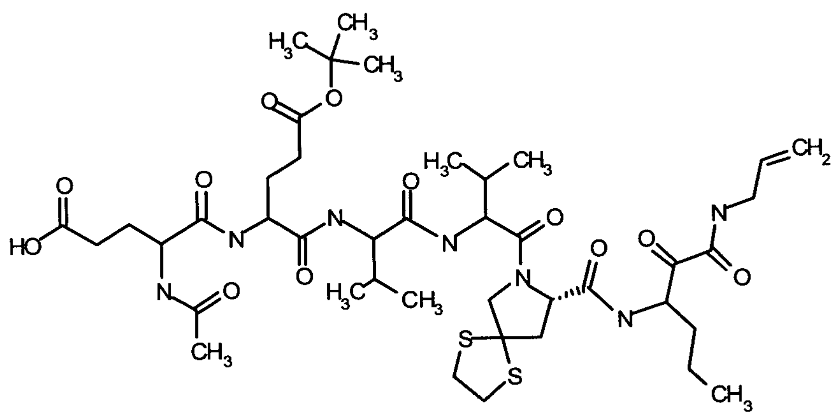


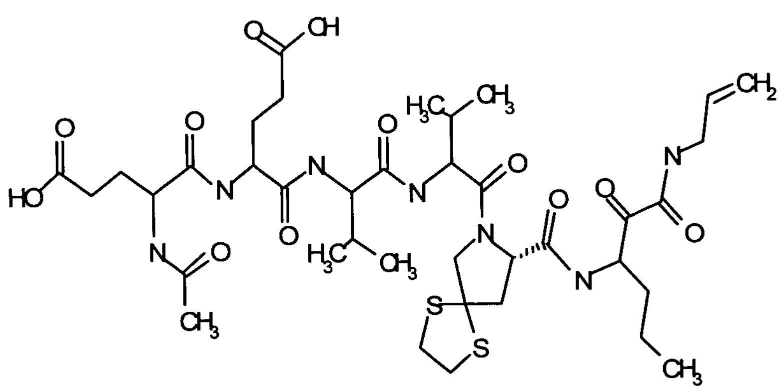


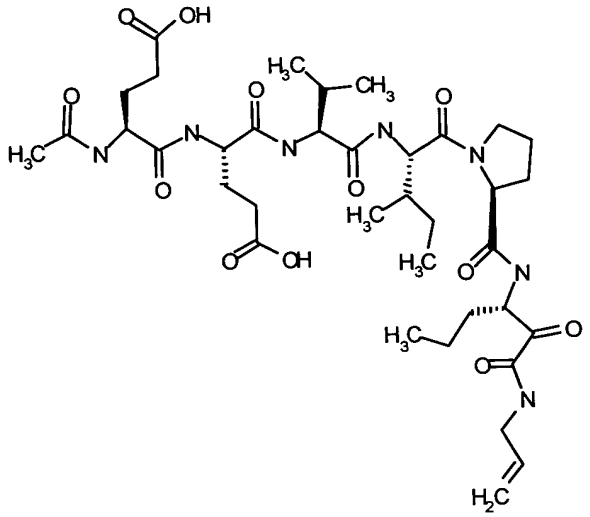


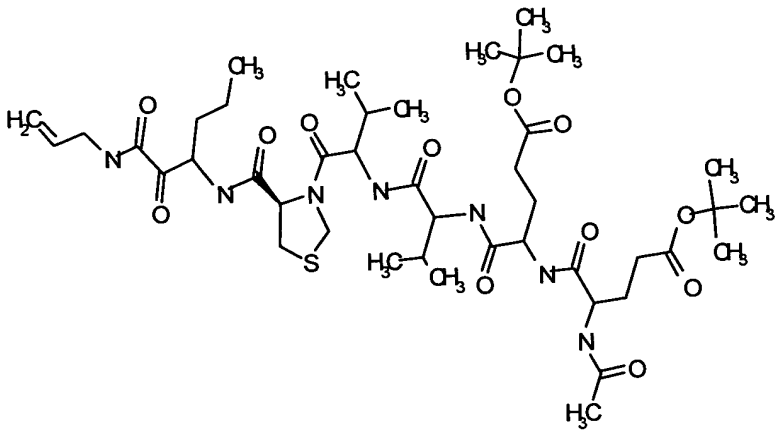


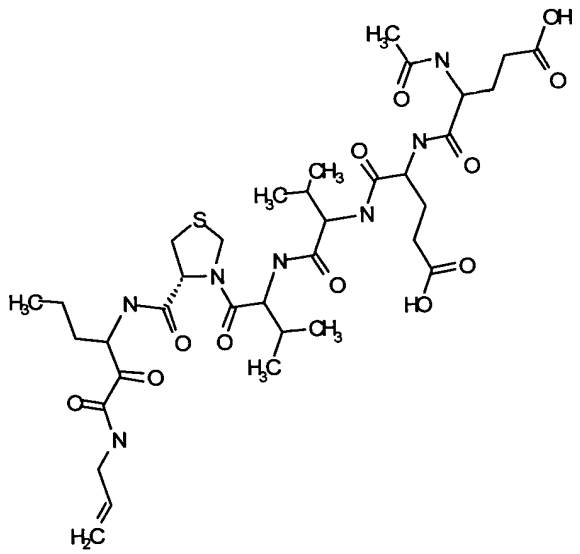


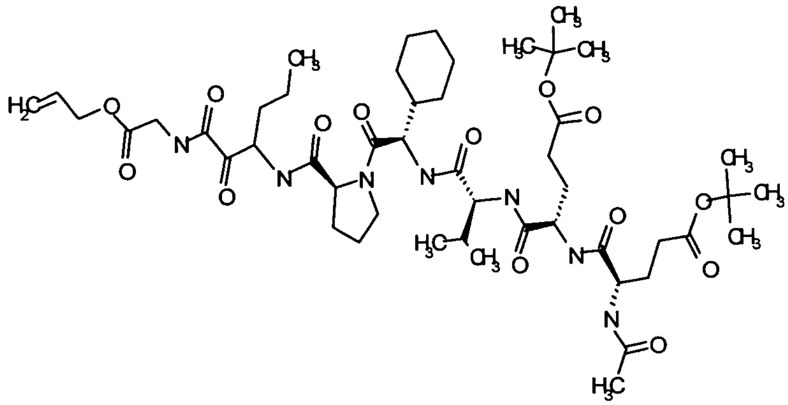


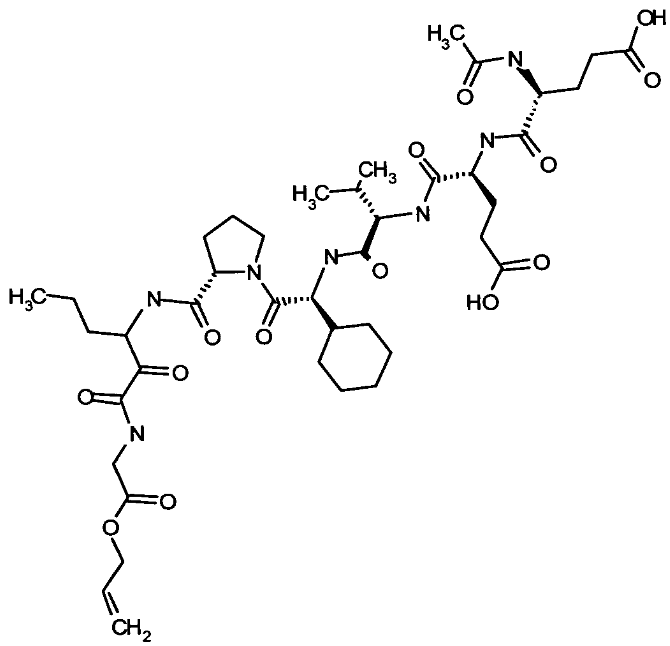


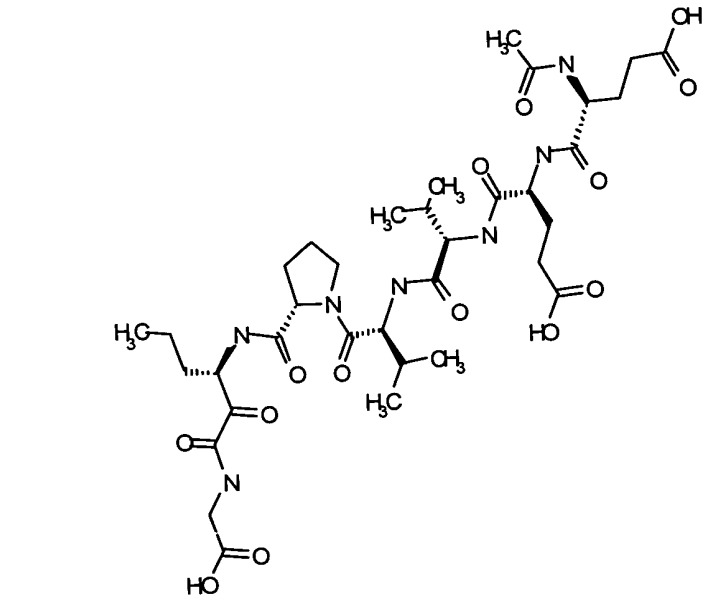


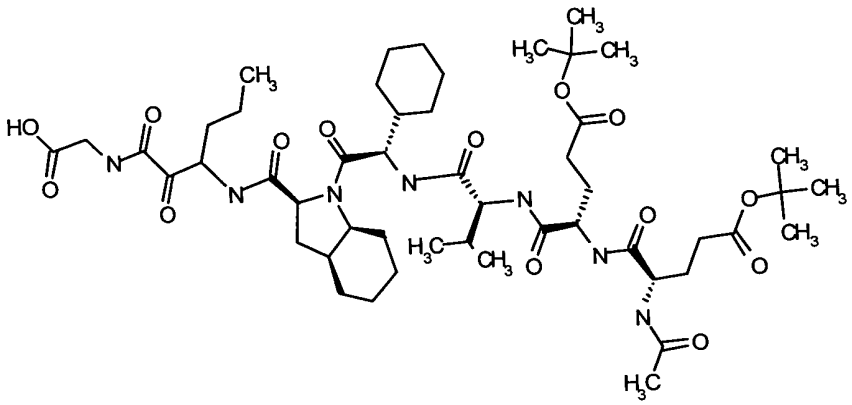


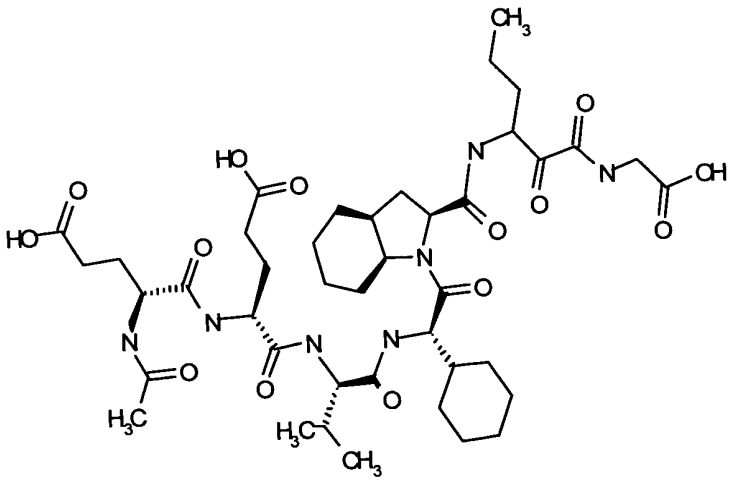


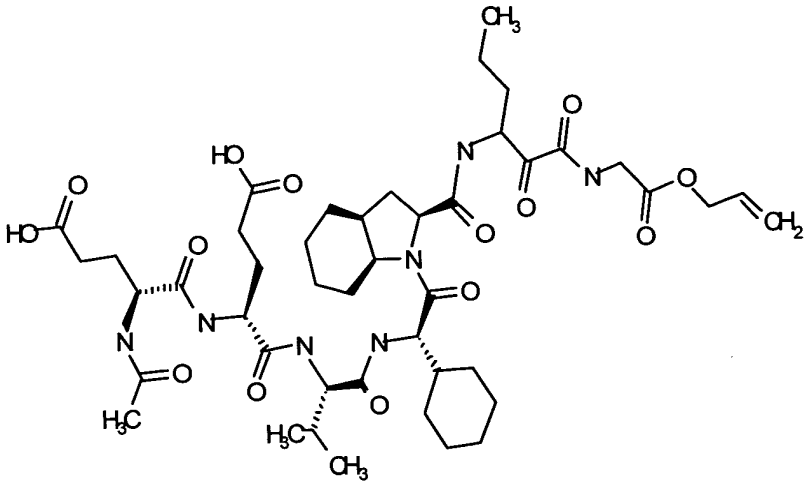


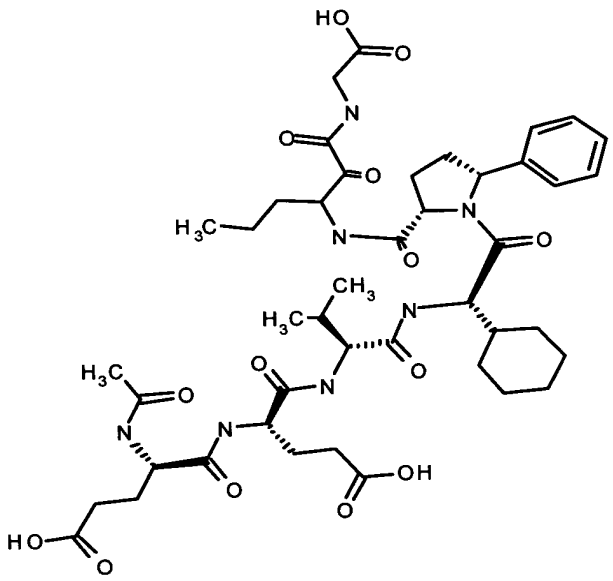


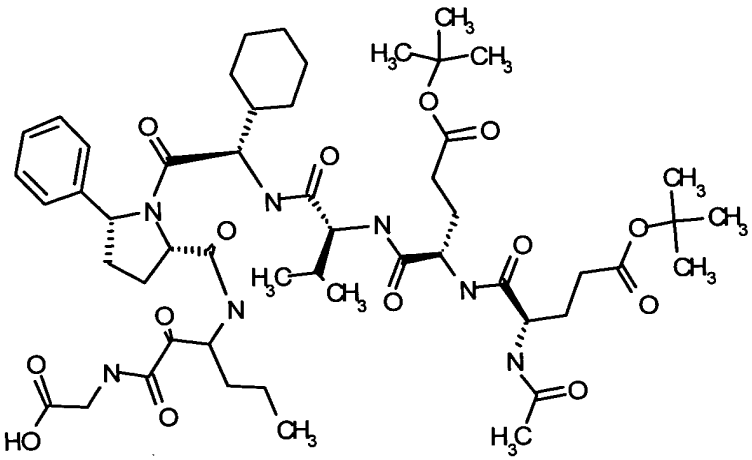


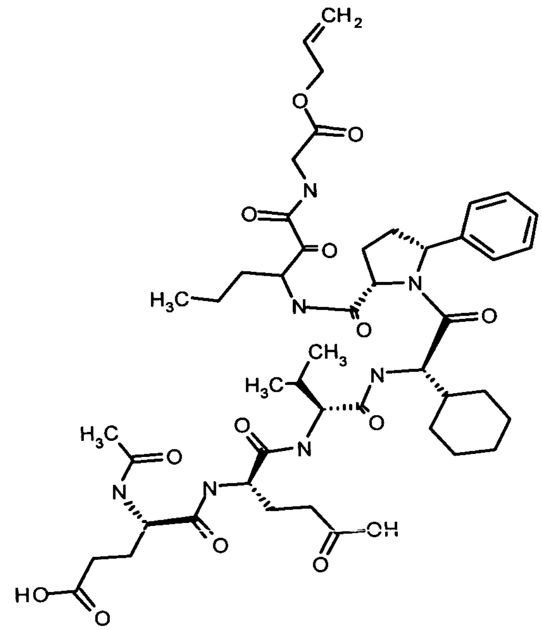


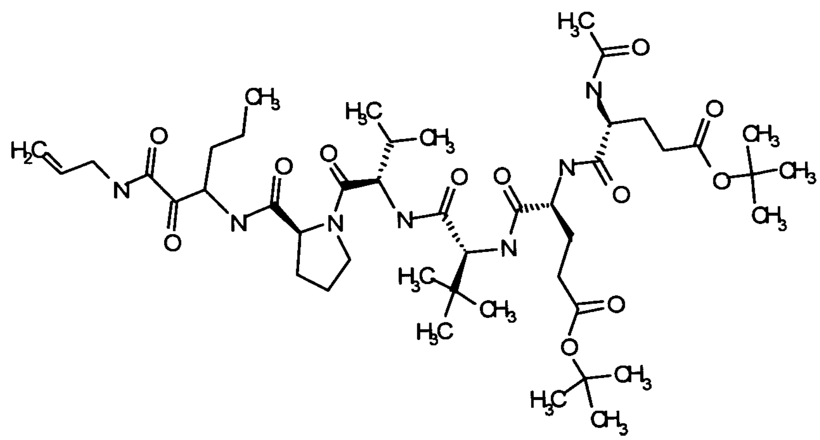


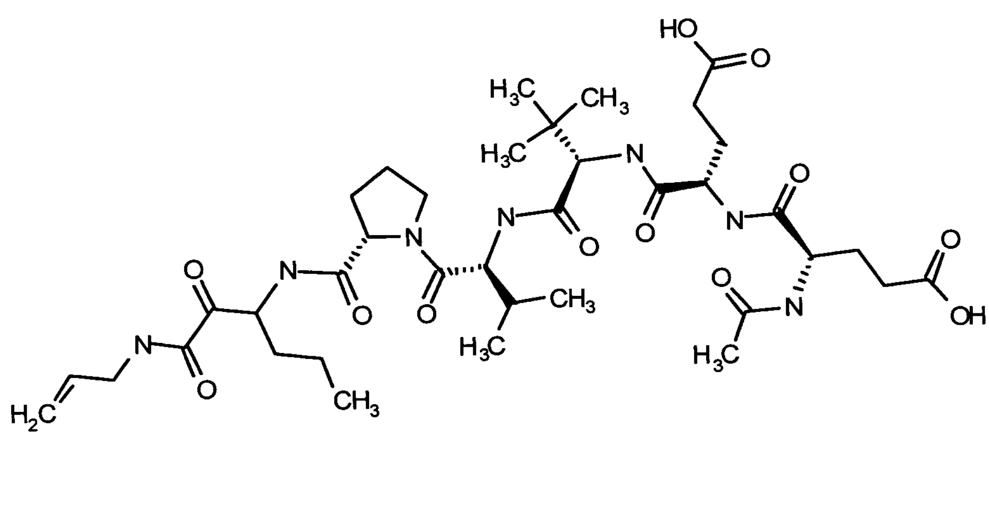


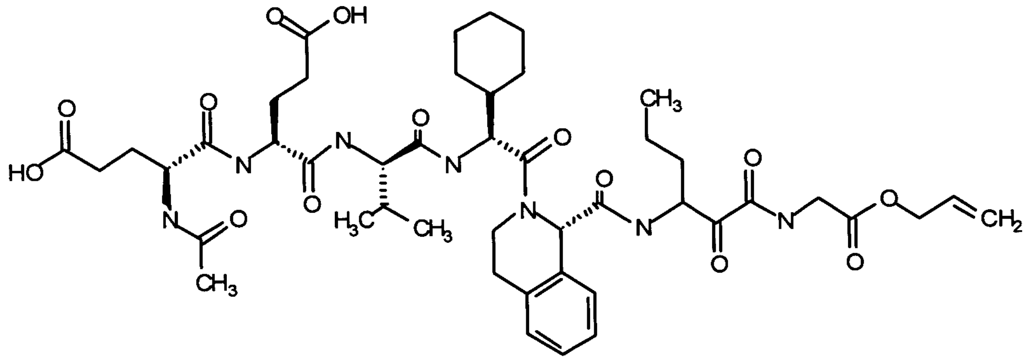


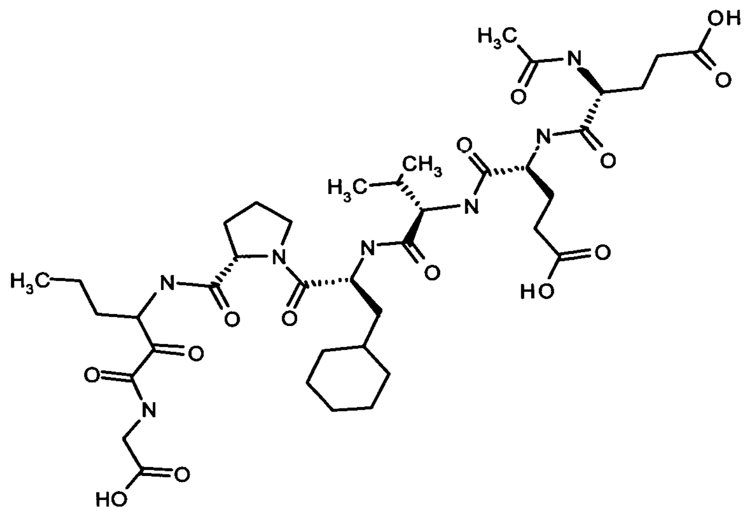


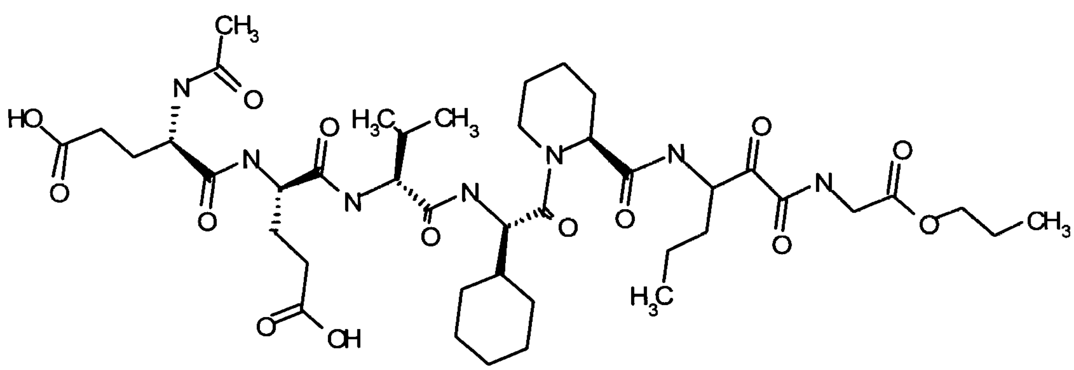


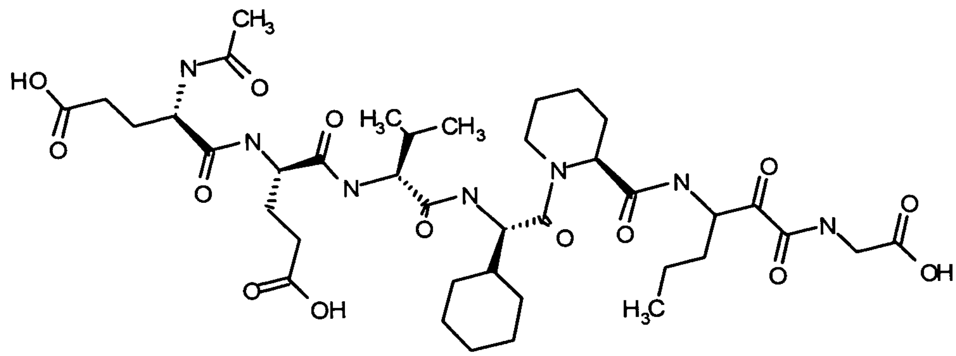


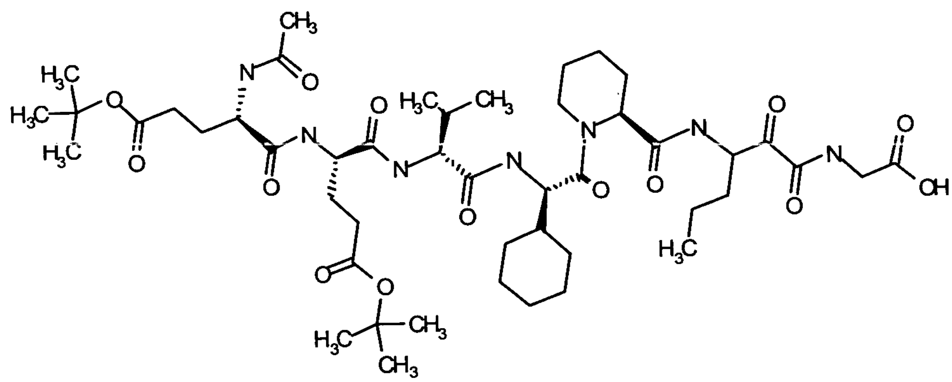


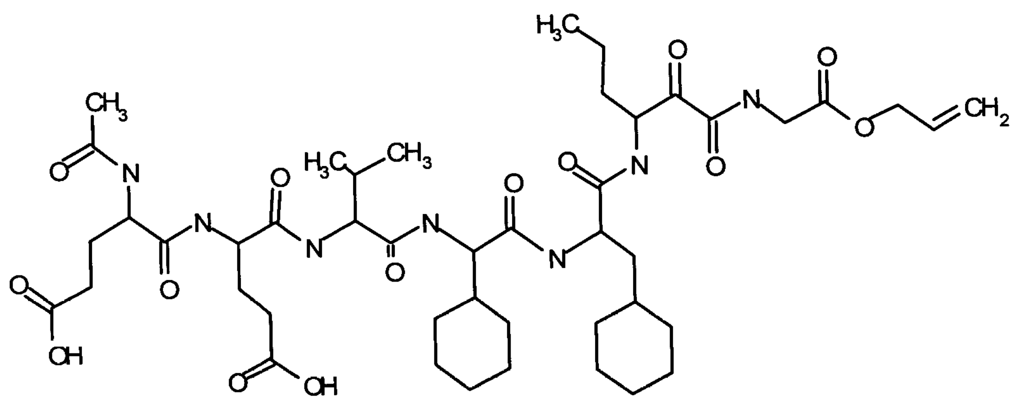


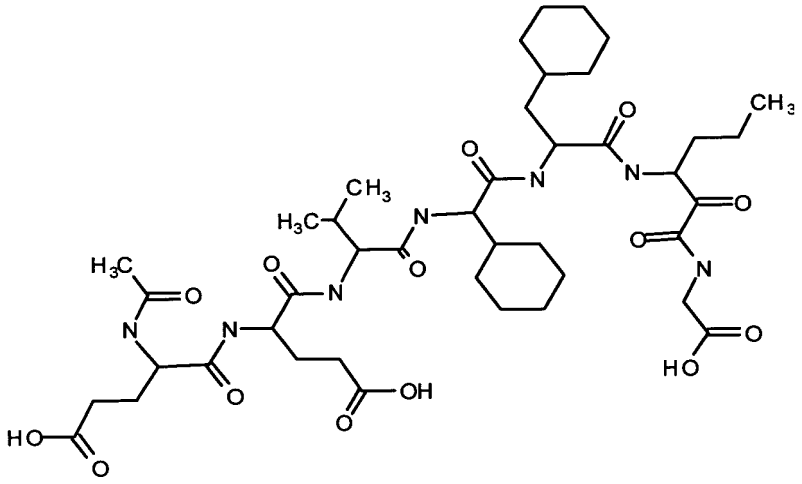


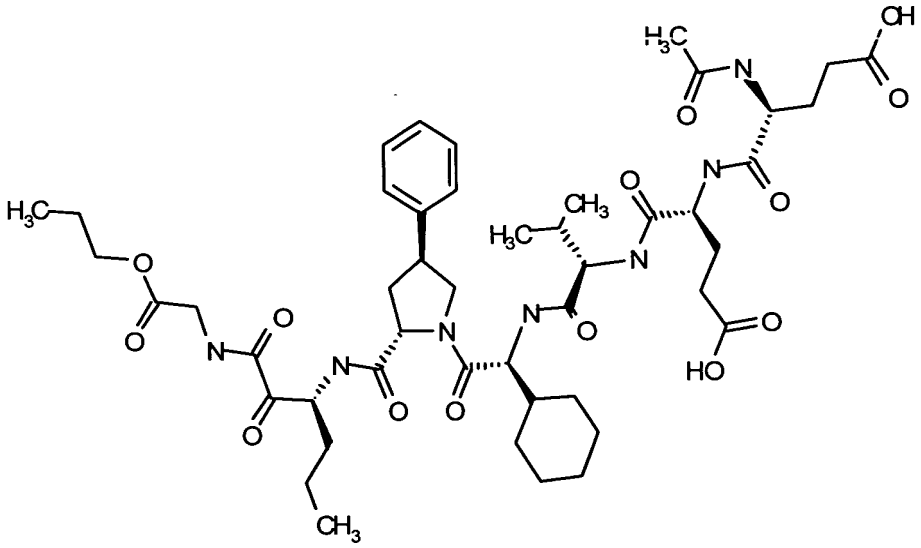


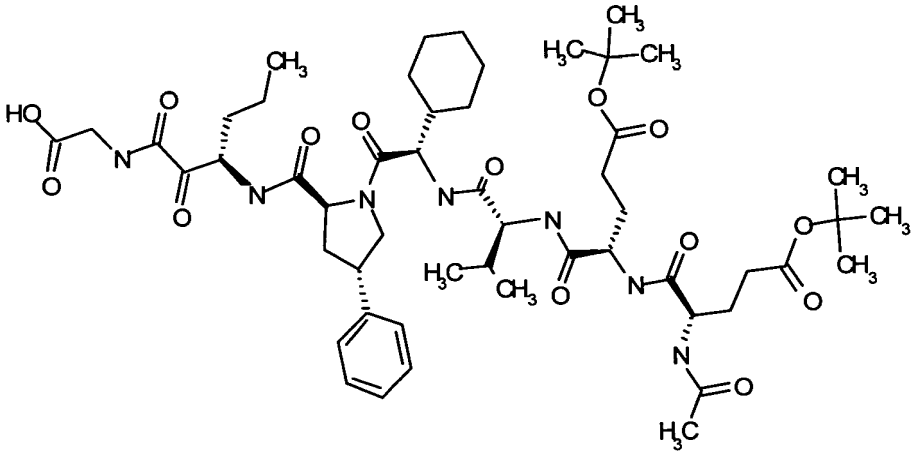


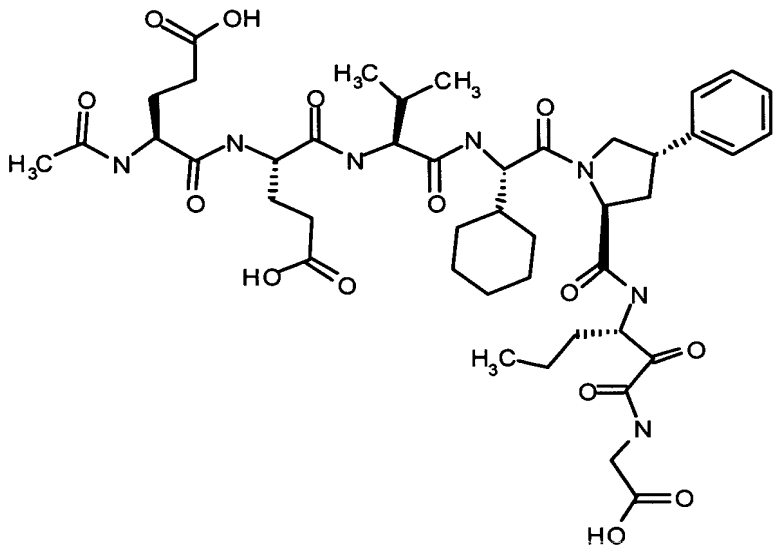


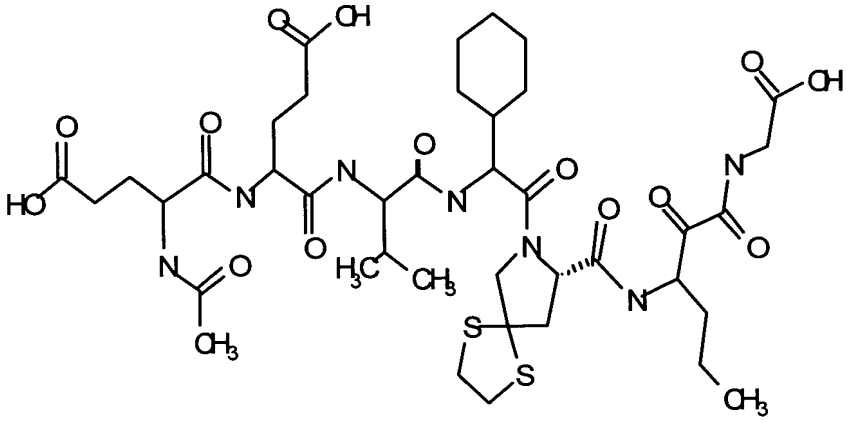


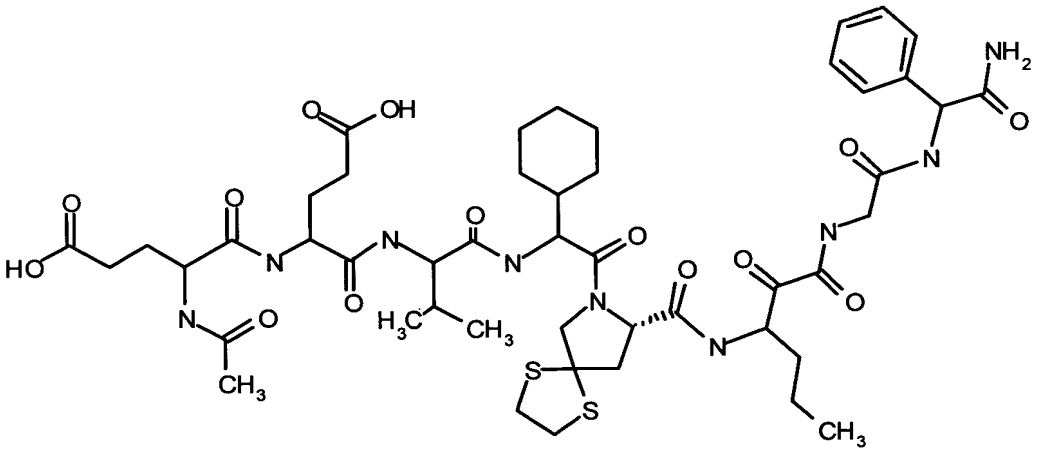


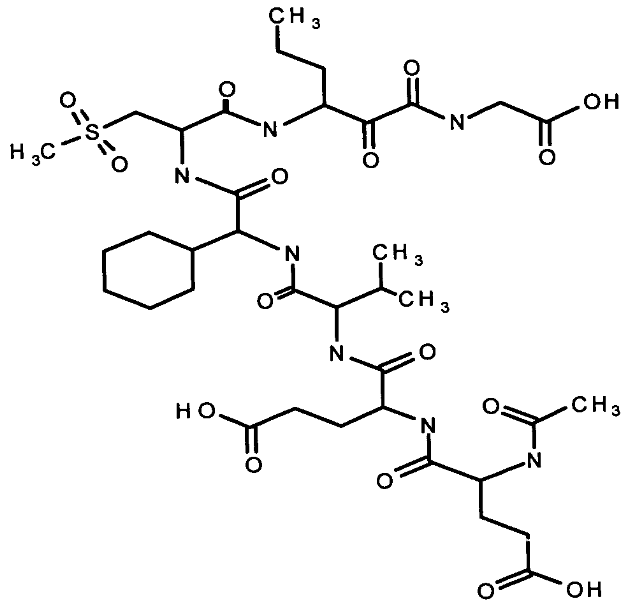


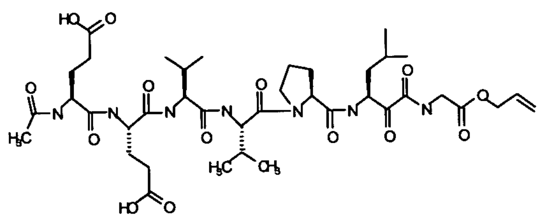


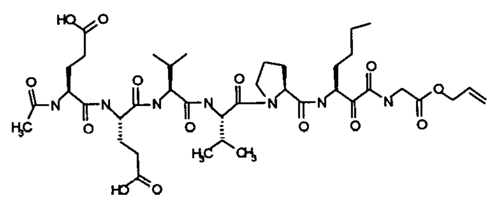


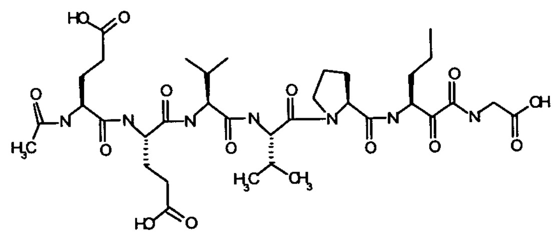


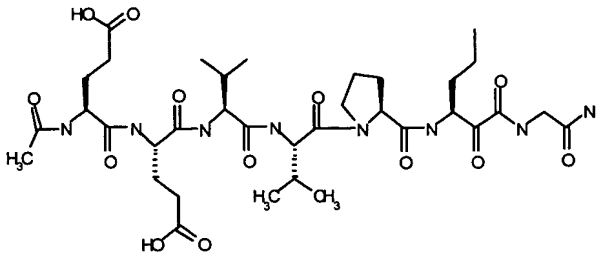


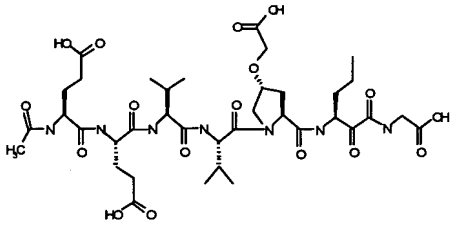


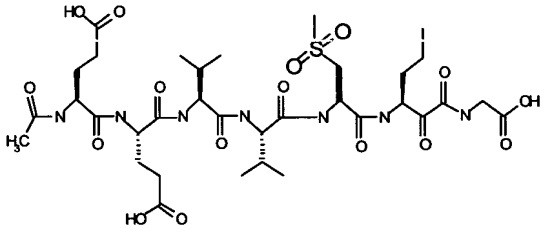


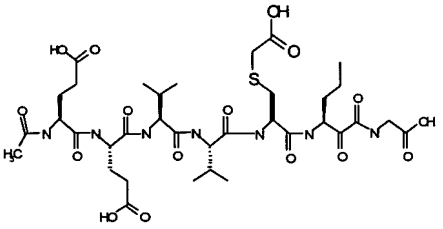












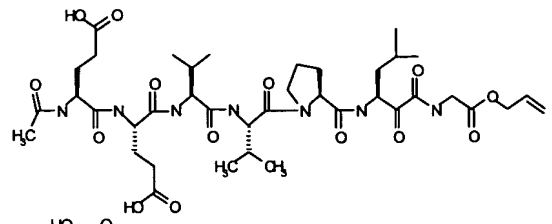
40. A pharmaceutical composition for treating disorders associated with the HCV protease, said composition comprising therapeutically effective amount of one or more compounds in claim 39 and a pharmaceutically acceptable carrier.

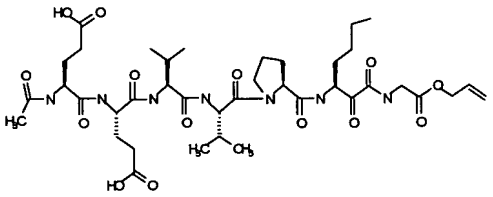
41. The pharmaceutical composition of claim 40, additionally containing an antiviral agent.

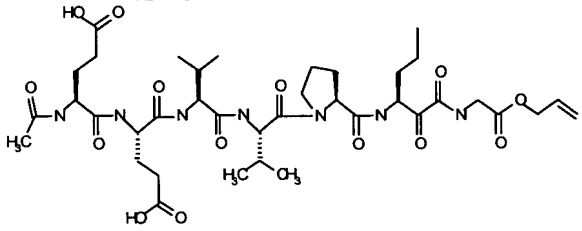
42. The pharmaceutical composition of claim 40 or claim 41. still additionally containing an interferon.

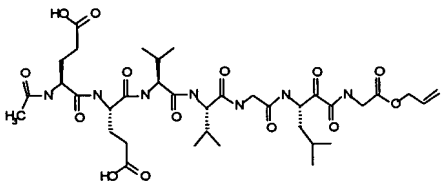
43. The pharmaceutical composition of claim 42, wherein said antiviral agent is ribavirin and said interferon is α-interferon.

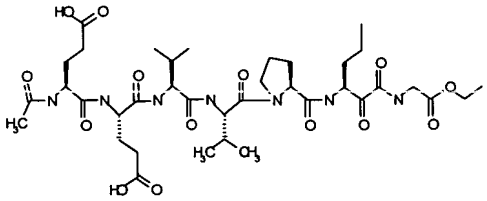
44. A compound selected from the group consisting of:

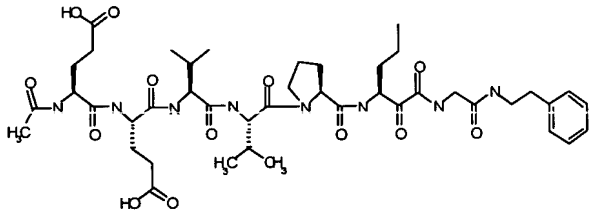


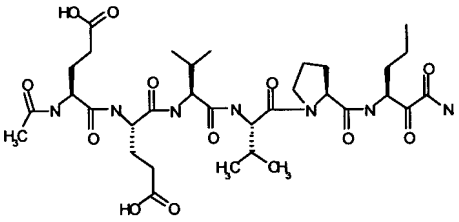


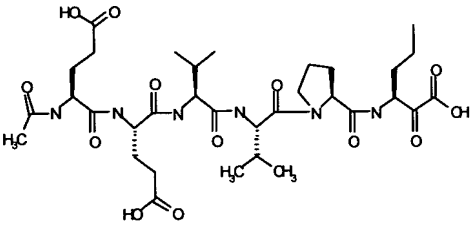


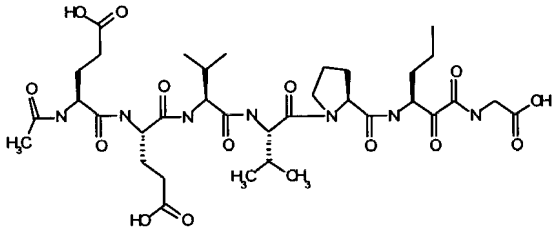


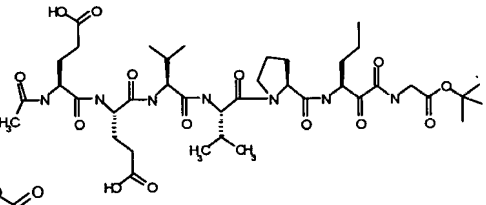


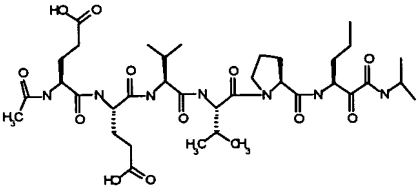


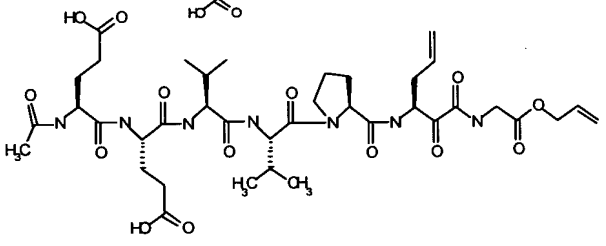


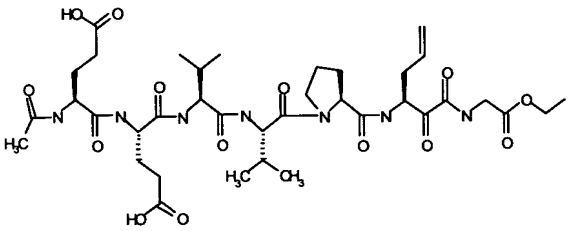


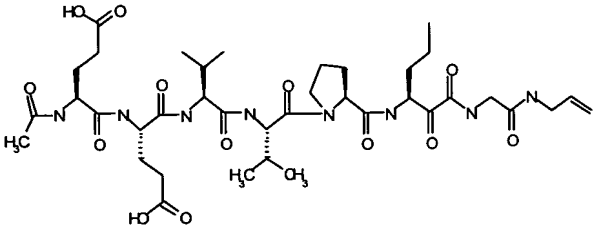


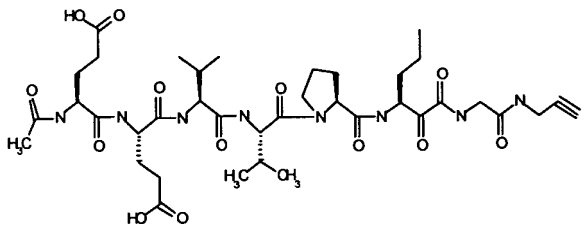


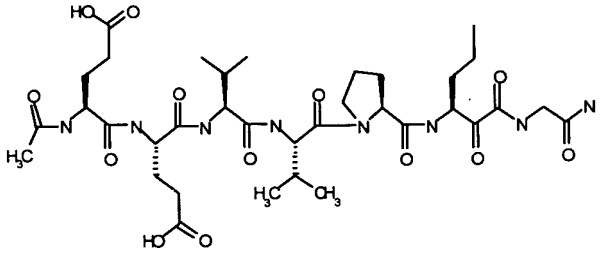


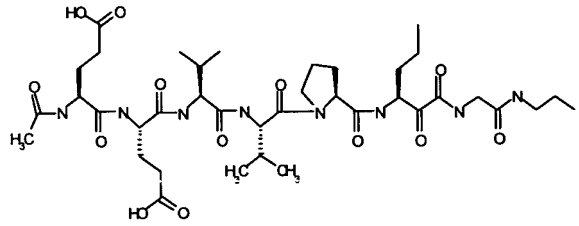


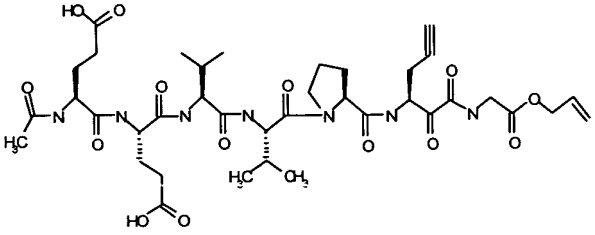


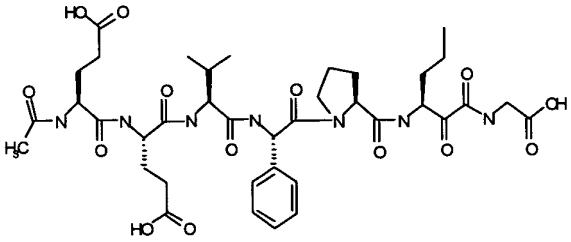


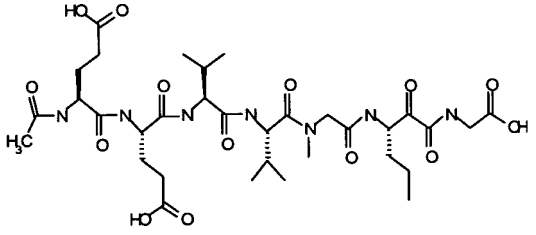


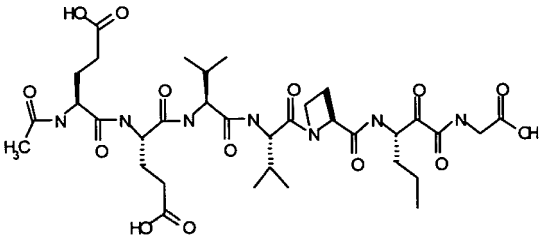


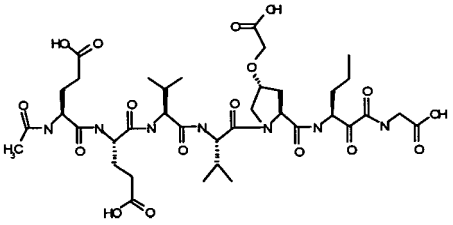


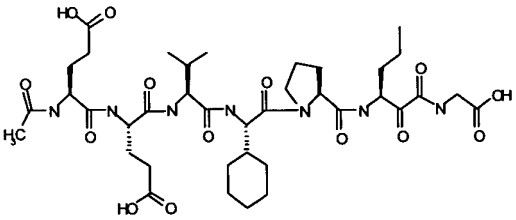


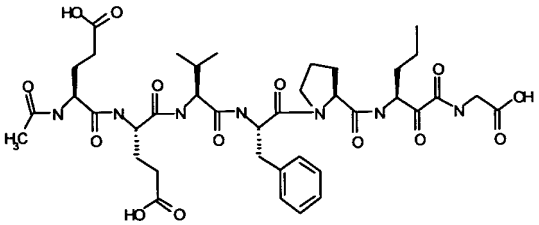


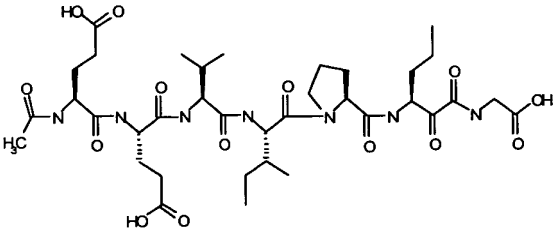


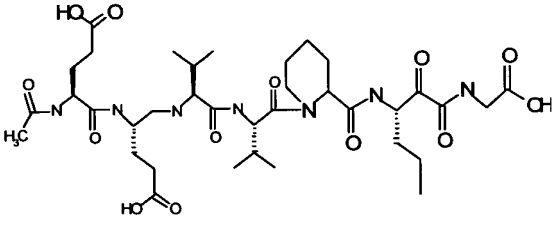


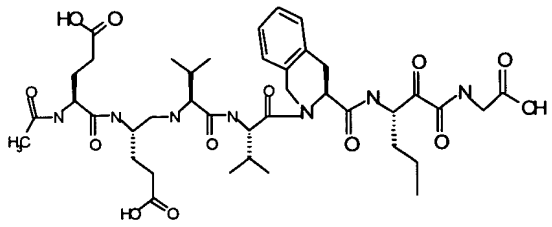


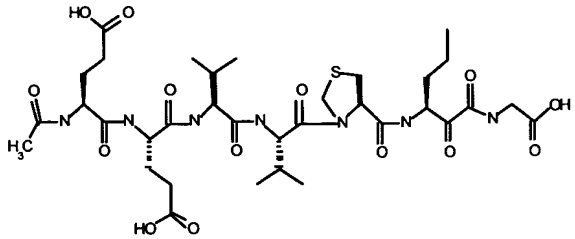


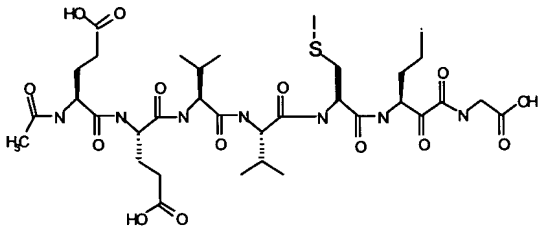


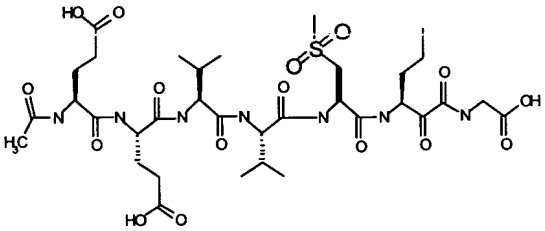


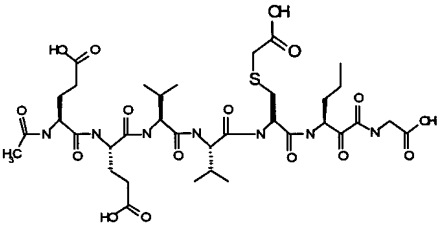


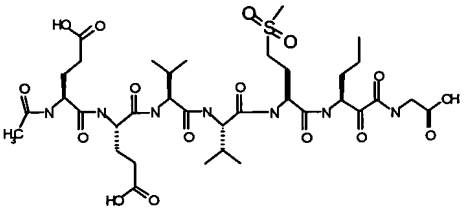


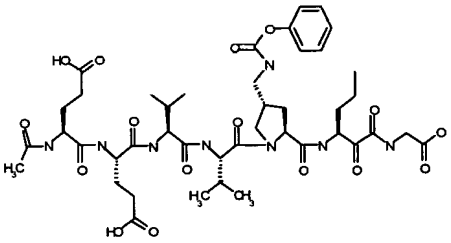


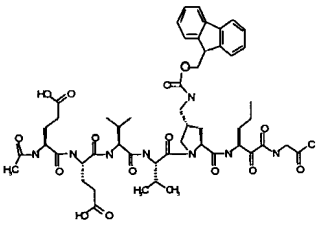


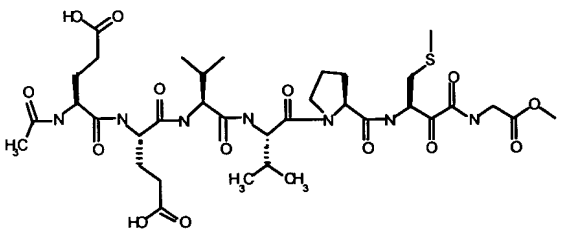


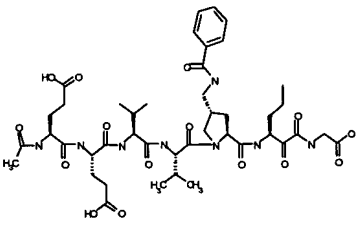


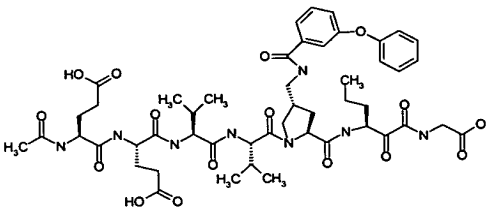


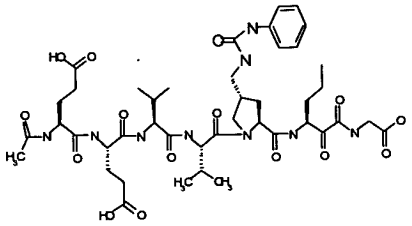


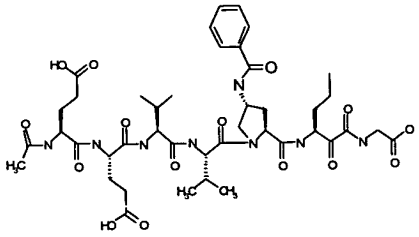


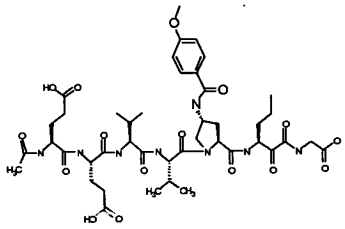


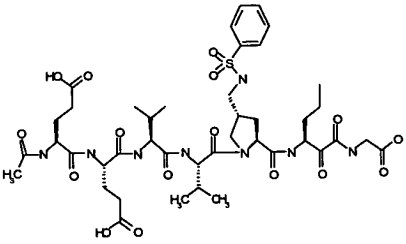


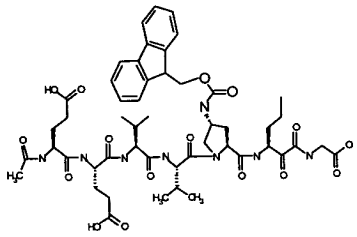


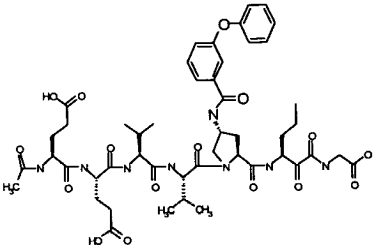


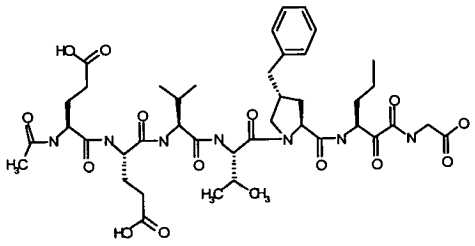


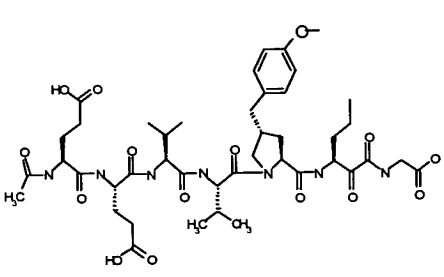


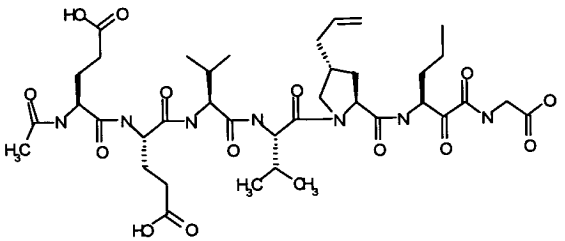


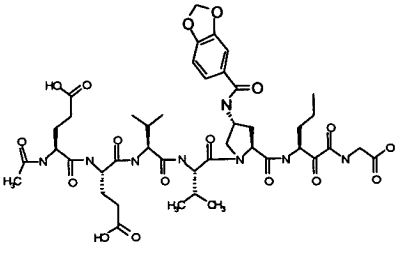


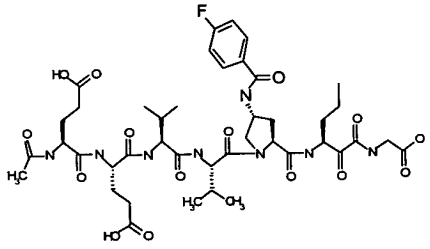


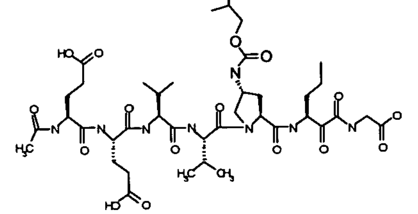


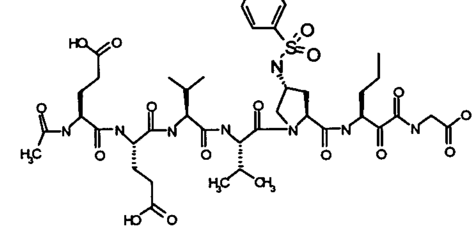


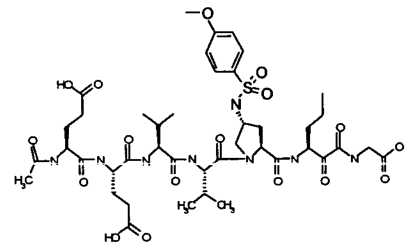


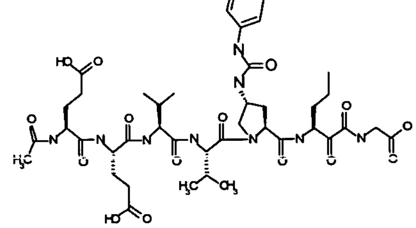


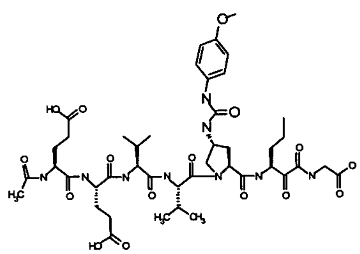


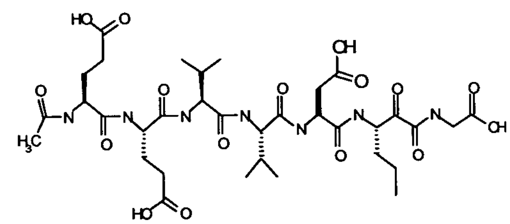


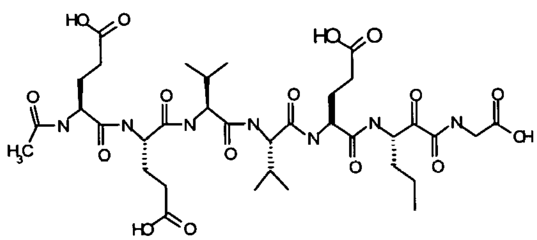


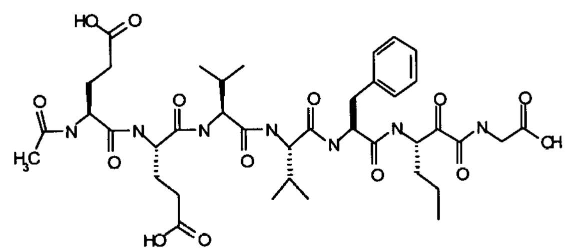


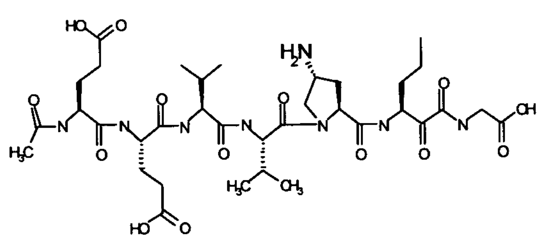


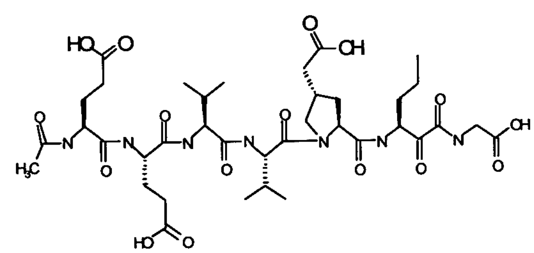


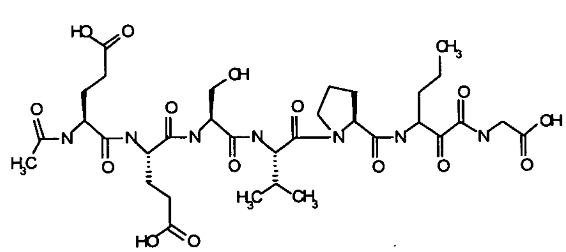


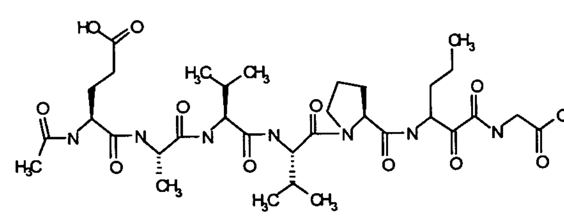


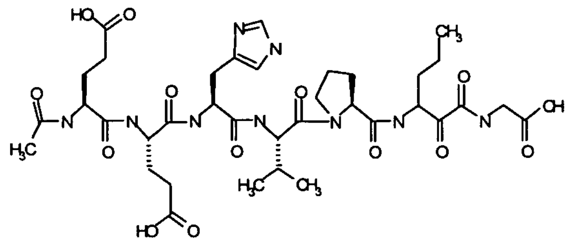


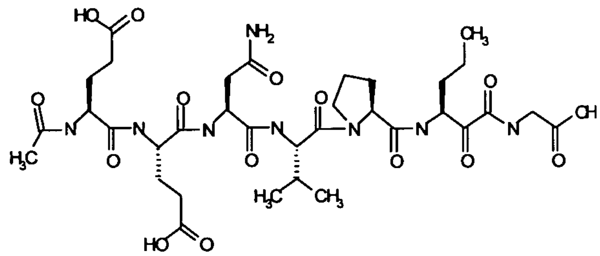


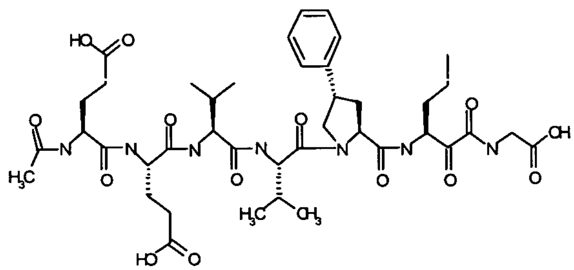


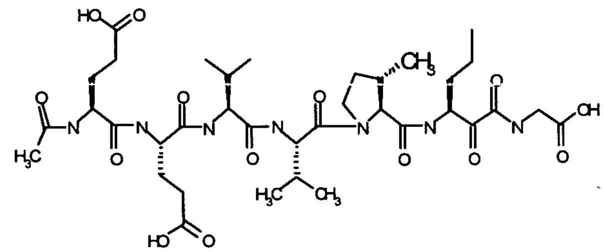


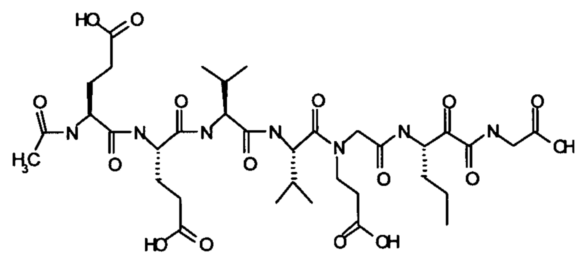


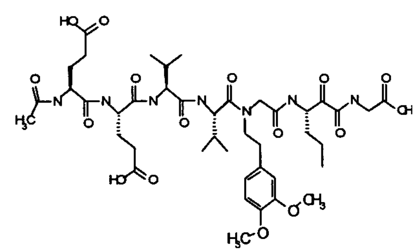


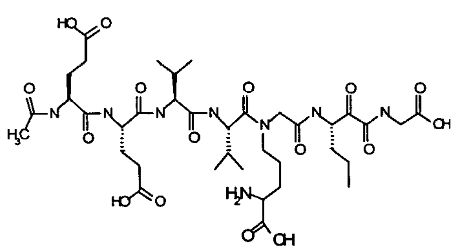


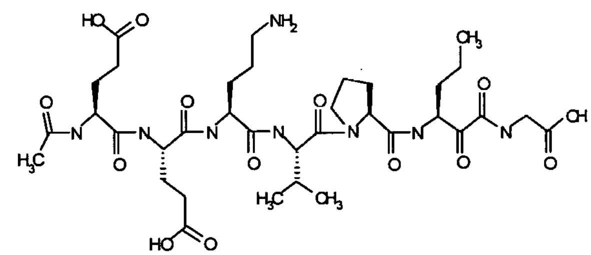


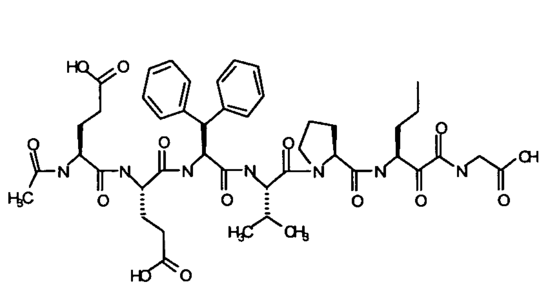


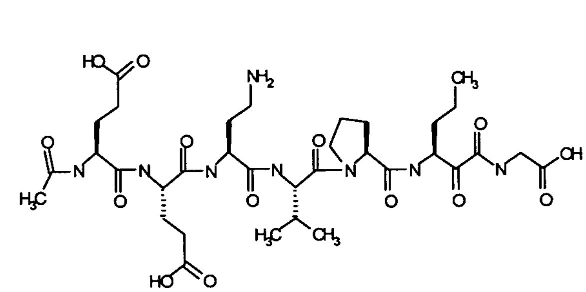


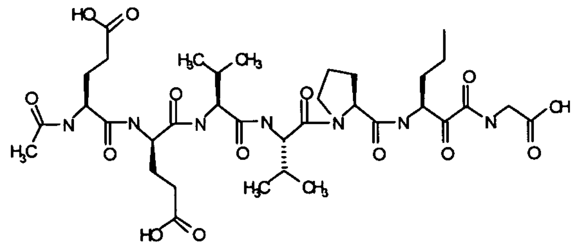


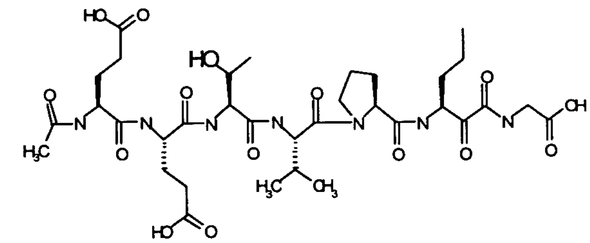


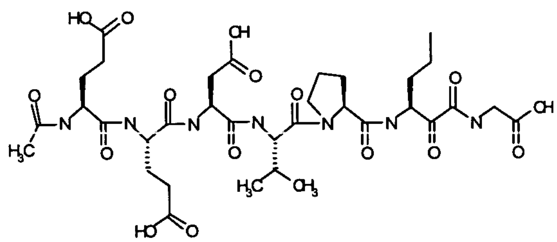


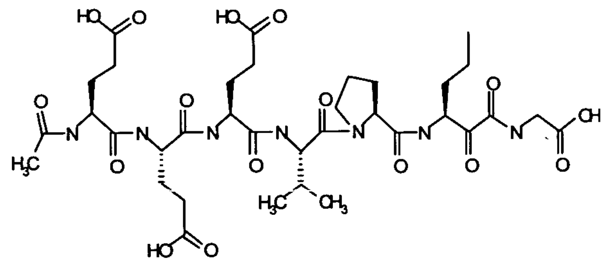


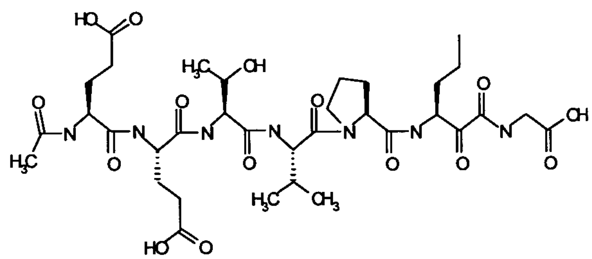


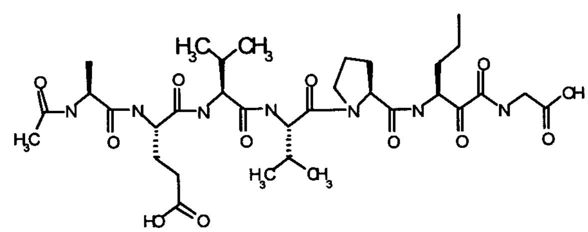


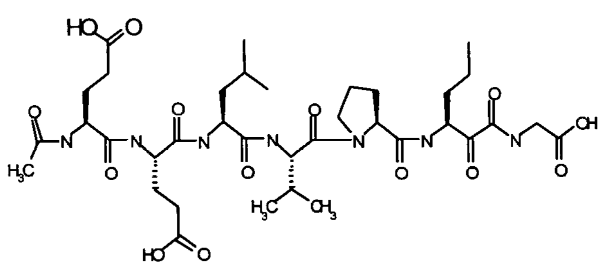


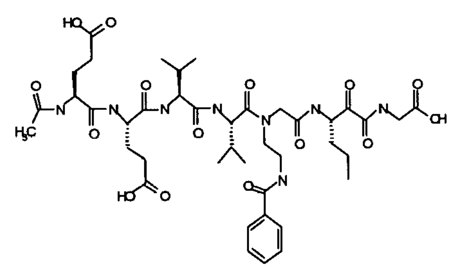


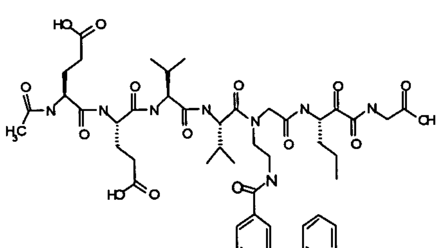


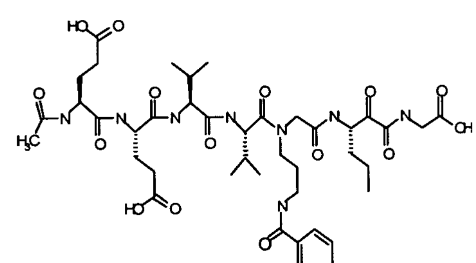


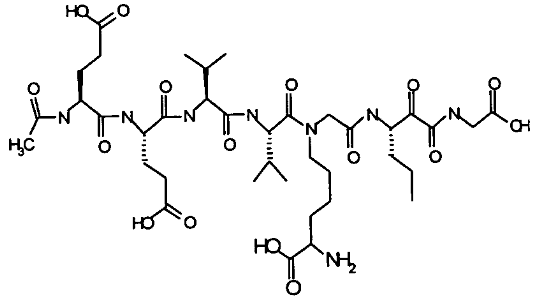


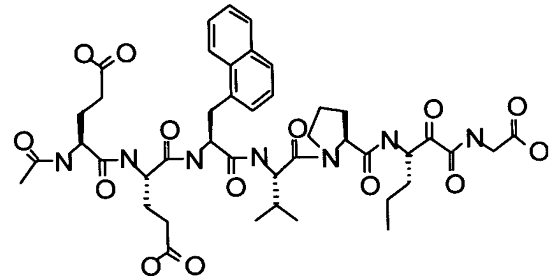


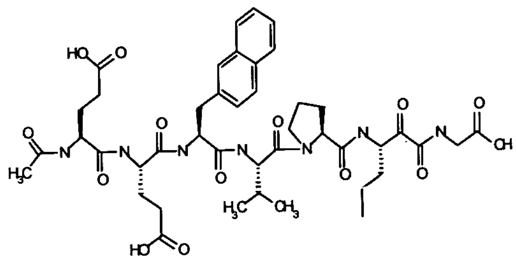


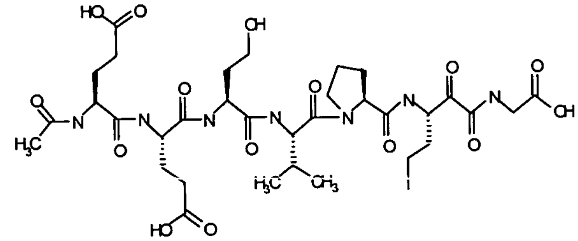


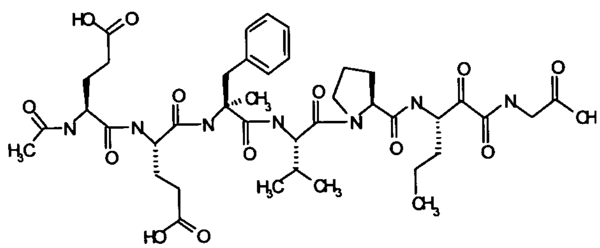


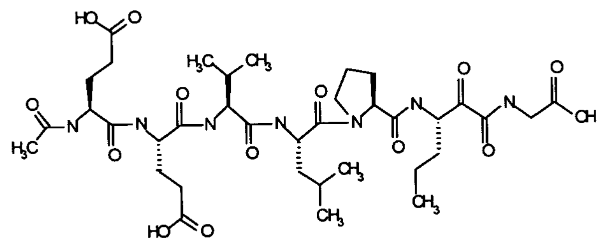


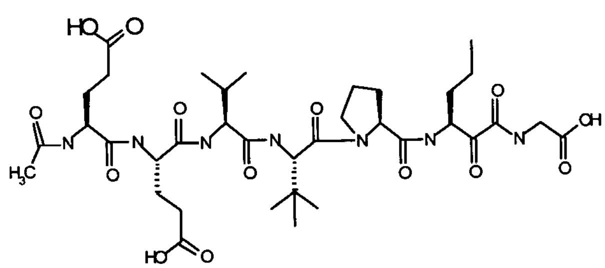


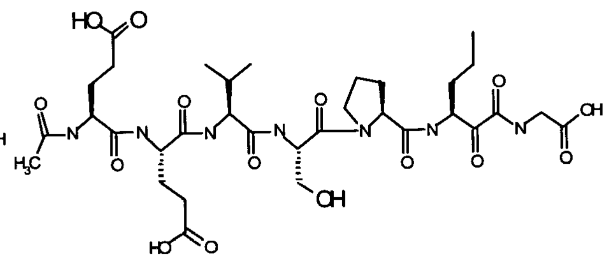


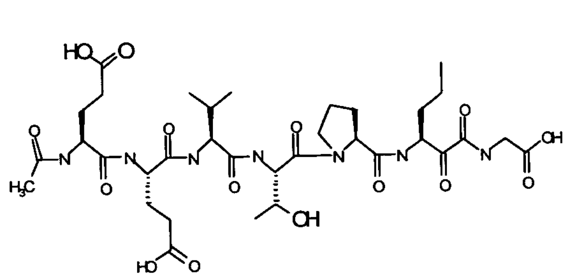


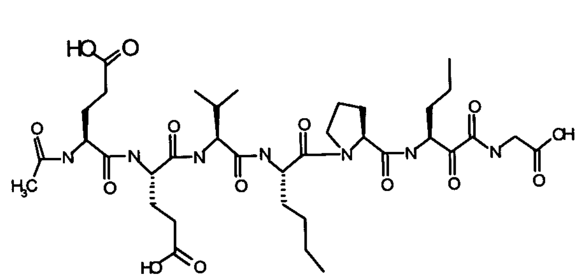


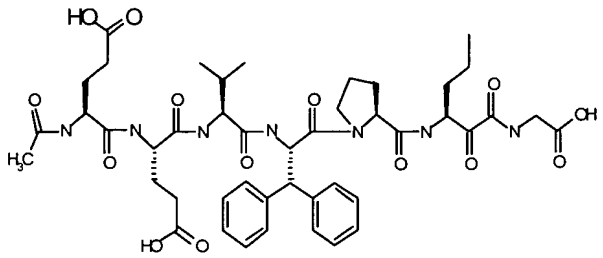


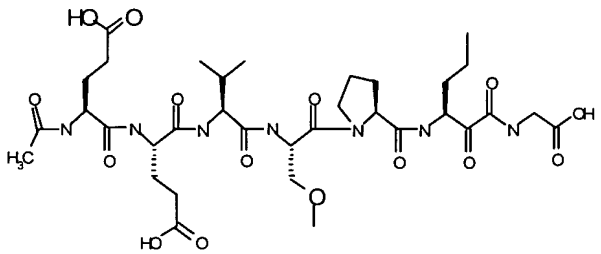


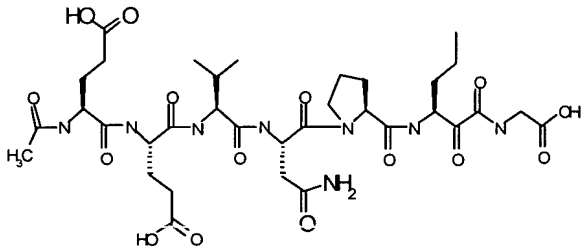


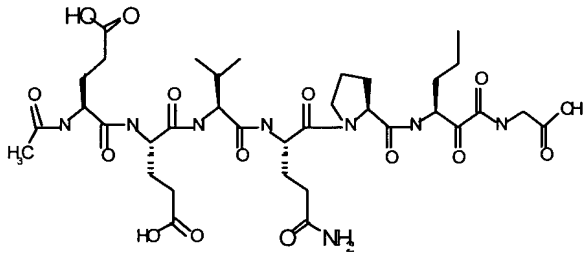


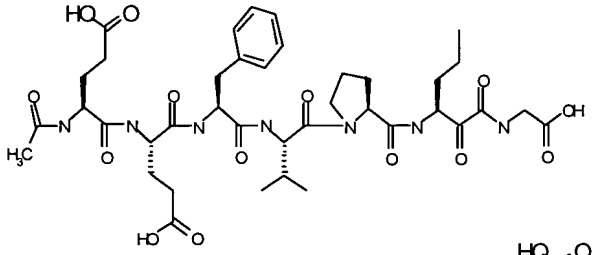


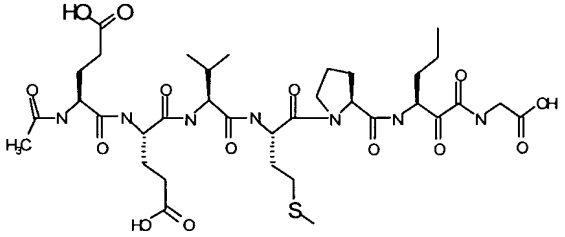




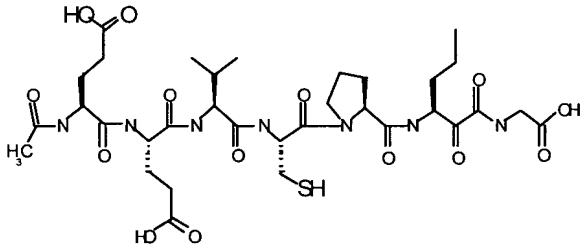








and



,

or an enantiomer, stereoisomer, rotamer or tautomer thereof, or a pharmaceutically acceptable salt or solvate thereof, wherein the compound exhibits HCV inhibitory activity.

~~45.~~ A pharmaceutical composition, comprising one or more compounds of claim ~~44~~.

~~46.~~ A method of treatment of an hepatitis C virus associated disorder, comprising administering an effective amount of one or more compounds of claim ~~44~~.

47. A method of modulating the activity of hepatitis C virus (HCV) protease, comprising contacting HCV protease with one or more compounds of claim 44.

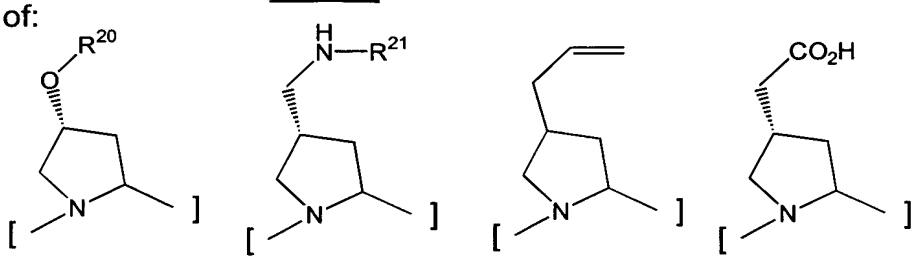
48. A method of treating, preventing, or ameliorating one or more symptoms of hepatitis C, comprising administering an effective amount of one or more compounds of claim 44.

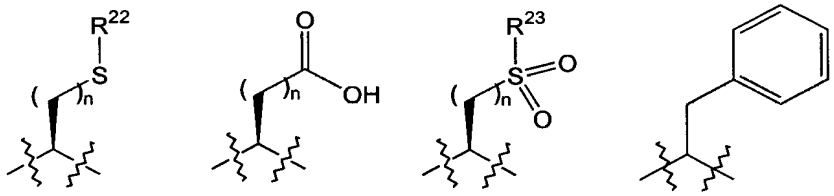
49. The method of claim 47, wherein the HCV protease is the NS3/NS4a protease.

50. The method of claim 49, wherein the compound or compounds inhibit HCV NS3/NS4a protease.

51. A method of modulating the processing of hepatitis C virus (HCV) polypeptide, comprising contacting a composition containing the HCV polypeptide under conditions in which the polypeptide is processed with one or more compounds of claim 44

52. The compound of claim 17, wherein P2 is selected from the group consisting of:





wherein:

n is 0, 1, 2 or 3;

R^{20} is alkylene-COOH;

R^{21} is C(O)alkyl, CO_2alkyl, C(O)aryl, CO_2aryl, SO_2alkyl, SO_2aryl, CONHalkyl, or CONHaryl;

R^{22} is alkyl or alkylene-COOH; and

R^{23} is alkyl.

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~~53.~~ The compound of claim 52, wherein:

R^{20} is CH_2COOH;

R^{21} is CO_2Ph, COPh, CO_2CH_2-9-fluorenyl, CO-(3-phenoxyphenyl), SO_2Ph or CONHPh;

R^{22} is methyl or CH_2COOH; and

R^{23} is methyl.